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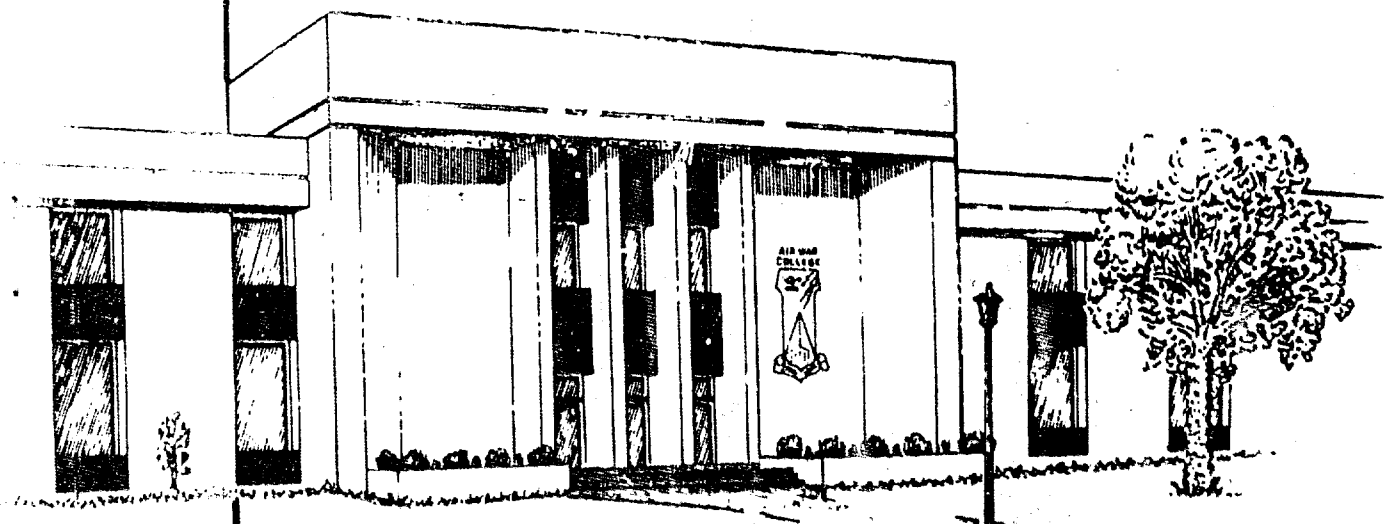
AIR WAR COLLEGE

RESEARCH REPORT

CLOSE AIR SUPPORT: PROUD PAST, UNCERTAIN FUTURE

COLONEL MELVIN L. "SMOKY" GREENE, JR.

1988



AIR UNIVERSITY
UNITED STATES AIR FORCE
MAXWELL AIR FORCE BASE, ALABAMA

AIR WAR COLLEGE

AIR UNIVERSITY

CLOSE AIR SUPPORT: PROUD PAST, UNCERTAIN FUTURE

by

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Colonel, USAF

A RESEARCH REPORT SUBMITTED TO THE FACULTY

IN

FULFILLMENT OF THE RESEARCH

REQUIREMENT

Research Advisors: Colonel Bruce S. Goodhue

Colonel Jimmie L. Coombes

MAXWELL AIR FORCE BASE, ALABAMA

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DISCLAIMER

This research report represents the views of the author and does not necessarily reflect the official opinion of the Air War College or the Department of the Air Force.

ACKNOWLEDGEMENTS

This paper, like my military service, is dedicated to my [redacted] daughter, [redacted] God willing, she shall see her children grow up free.

My thanks as ever to my wife, [redacted] who encouraged me and suffered with me through the production of this paper.

To those with whom I have had the privilege to serve, my gratitude for the lessons and memories, some of which are recorded in this work.

I thank my Air War College faculty advisors, Colonel Bruce Goodhue and Colonel Jimmie Coombes for their helpful advice and encouragement.

AIR WAR COLLEGE RESEARCH REPORT ABSTRACT

TITLE: Close Air Support: Proud Past, Uncertain Future

AUTHOR: Melvin L. "Smoky" Greene Jr., Colonel, USAF

A novel style vignette of a future European close air support mission introduces a discussion of the on-going debate over close air support; whether it is practical and needed in the high-threat NATO battlefield. A description and comparative analysis of the planned employment of close air support and battlefield air interdiction missions is used to illustrate the impact of air defenses and the relative payoffs of these missions. The author attempts to establish the continuing need for close air support and therefore the need to improve command and control structures for this mission. Other needed mission improvements are also discussed. Keywords: command, control and communications. (KR)

BIOGRAPHICAL SKETCH

Colonel Melvin L. "Smoky" Greene Jr. (M.S., Troy State University) has been directly involved with air support of ground forces practically continuously since his initial assignment after pilot training. He served as a forward air controller in Southeast Asia in 1969, flew the F-100 for several years, and returned to Thailand as an A-7D "Sandy" pilot in 1973. Colonel Greene is a 1975 graduate of the USAF Fighter Weapons Instructor Course (A-7D). He spent ten years in various European assignments between 1975 and 1985, including exchange pilot in the Royal Air Force Harrier in Northern Germany, and A-10 squadron commander in England. Colonel Greene is a graduate of the Air War College, class of 1988.

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CHAPTER I

INTRODUCTION

This paper is about the debate over Close Air Support (CAS) -- the ability of airpower to place weapons exactly where and when the ground forces need them in a situation where the target selected by the ground forces is "close" to friendlies.

Most would agree that the risks inherent when dropping weapons near friendlies demand that we take extra precautions and if necessary, devote relatively more resources than are required for an equivalent operation not near friendlies.

At the same time, a militarily useful capability calls for routinized operations of great scale -- perhaps hundreds or thousands of sorties per day.

These apparently competing requirements and standards present us with some questions:

How badly do we need to do this thing called CAS ?

How much CAS do we need to do?

What kind and how many resources does CAS take ?

My paper provides some thoughts on these questions. Satisfactory answers to "the CAS question" are not easy to find nor put into effect. My paper attempts to bring the view from the fighter cockpit into the boardroom and the design office.

(AUTHOR'S NOTE. Let me save you reading the next 80 pages; we definitely need to be able to do a lot more CAS than is possible now, and our most glaring deficiency and urgent need is more and better command and control for our fighters in the battle area.)

The author would be disappointed to have this work dismissed as the ramblings of a "CAS zealot" caught up in the romance of the days of cloth-covered wings. A good Air Force is capable of effectively performing all the missions for which it writes doctrine. This paper is motivated by the author's observation that an effective close air support capability is apparently (once again) a casualty of peacetime demobilization.

Other Air Force missions seem to enjoy more consistent advocacy and support. Without wishing to minimize the importance of those other essential missions, the author merely wishes to add to the understanding of this traditionally controversial, but very vital mission.

Some of these thoughts may be contentious, but ... "If everyone is thinking alike -- nobody's thinking."

CLOSE AIR SUPPORT : PROUD PAST, UNCERTAIN FUTURE

> Colonel Wesley James was acutely aware of every one of his 44 years as he attempted to pull the nose of his A-16 CAS Falcon toward what he hoped was the target described by the shrill and often interrupted voice in his headset. It felt like one of his stubby wings was in the ugly grey clouds and the other was barely clearing the trees flashing below. In fact he knew he was working under a 700 foot ceil'ng in six kilometers of visibility which was about par this time of year in Central Germany and if not fun, at least acceptable for what he was doing.
>
> What he was doing was trying to prevent three Soviet armored divisions from overwhelming the remnants of a U.S. and German brigade dug in near Fulda. Although Colonel James was the Deputy Commander for Operations of the 50th Tactical Fighter Wing at Hahn, even he was unaware of the full implications of his mission for

NATO on May 3, 1990, the second day of what he assumed to be World War III.

For the decade of the 1980s armies everywhere had pretty much assured air forces everywhere that, "We can handle the first echelon. We need you airmen to disrupt and delay the second echelon so we are not overwhelmed." Air forces everywhere then bought airplanes and wrote doctrine to attack advancing columns in the enemy rear as they marched toward the front. Airmen everywhere welcomed the fact that they would not be employed over a hotly contested battlefield, flying through the smoke, fire, SAMs, and confusion of modern land armies locked in violent combat below.

But that's exactly what James saw now. It assaulted his equilibrium. He fought to sort out his proper place in this epic maelstrom. As best he could determine over his jammed radio, his job was to drop his four cluster bombs on a certain group of vehicles hidden in a small wood somewhere on this profusion of explosions, smoke, and dust. He had followed the instructions of several voices during the 15 minute flight from Hahn. Now he was here in the thick of battle on a CAS mission.

CAS ! If he made a mistake his bombs could fall on friendly troops. There could be a number of SAMs in the air closing in on him or his young wingman at this very second. It would be difficult to see them much less avoid them -- mainly because the pilots did not know the exact target location and would have to concentrate on looking for the target rather than looking out for enemy threats. James focused on finding his target, dropping his bombs, and getting out of there.

The forward air controller (FAC) down there was not much help. James had been unable to hear the target coordinates which he could have entered into his navigation and attack computer. All he heard was ..."small village... north... treeline...vehicles..." . He sat next to a multi-million dollar box full of micro chips that could guide him to any point on this battlefield within a few feet -- but without accurate target coordinates from the FAC, it was just ballast.

This was a far cry from the days when as a young F-4 jock he had rolled in from 15,000 feet over Vietnam with the FAC's "Willy Pete" smoke blooming above the trees. He couldn't see the targets down there under the jungle canopy but he believed someone could -- either the FAC himself or someone talking to the FAC. All he had to do was hit the smoke. There were antiaircraft artillery (AAA) guns and even a few surface to air missiles (SAM); but at those altitudes

it was pretty safe, even for the FAC in his OV 10 Bronco. If there were troops in contact, the same process worked but with a little more care given to bombing accuracy and running parallel to friendly positions. CAS in retrospect was easy then. There was hardly ever any radio interference and you could take your time and make several passes. The FAC really did all the work.

Years later, as a young major, James had helped introduce the A-10 CAS plane into Europe. It was clear that some things that worked pretty well in Vietnam would not work in Germany. OV-10 FACs would probably not be able to fly in the battlefield coordinating with the Army and helping fighter pilots find the right targets. More and more, the Allies had come to rely on FACs on the ground with the army units. But being on the ground made it hard for a FAC to see the target as the fighter pilot sees it and also limited the range of his radios. FACs were sometimes in helicopters which helped a little.

The pervasive low clouds and the anticipated SAM and AAA threats kept tactics focused on flying very low and fast, hitting quick and getting out of Dodge. That allowed FACs only seconds to talk a fighter pilot's eyes on to his target. It made CAS damned hard to do--dangerous for the pilots and dangerous for the army troops. Allied pilots proved that to themselves during every CAS training exercise. Time after time they hung exposed in the sky over the exercise area, their jets moving faster than their inexperienced FACs could talk, finally pulling off target, occasionally successful, but more often frustrated at never seeing the target.

The A-10 pilots, with their focused training and specialized bird could do pretty well supporting the army even without much help from the FACs, but many military leaders and defense analysts seriously questioned the ability of the big, slow A-10 to survive the lethal SAM and MiG interceptor threat.

The many difficulties of performing CAS gave NATO fast jet jocks a strong preference for battlefield air interdiction (BAI) over CAS. This was reinforced by the armies' claim that they could handle the first echelon (without CAS) if air force BAI could disrupt the second. Over the years this set of preferences became accepted NATO policy.

Colonel James had Hahn's pilots well trained in BAI. With their nav attack computer programs optimized for the mission, they could plan quickly and fly confidently in their BAI target areas. Unlike his present uncomfortable situation, the pilot always had his exact target location when he planned and briefed

his mission. There were also lots more airplanes along to add weight to the attack and help saturate the air defenses, whereas CAS tasks tended to come down from HQ specifying only two aircraft. James was convinced this was a fundamental mistake but he was glad only two of them were exposed to this mess today.

Yesterday throughout the Central Region NATO attack pilots had executed BAI plans with varying degrees of success. With the fighting only 10 hours old, it became painfully clear that the army could not hold the first echelon without massive close air support. Senior officers were also disappointed at reports on the level of damage and delay airpower had inflicted on Soviet second echelon forces in key sectors. Seeing little option, CINCENT ordered everything that could drop a bomb roled to CAS. Unfortunately, training of pilots in CAS had long been neglected as had NATO's woefully inadequate air support coordination and control system.

The colonel had unintentionally allowed his speed to bleed off to 325 knots when he thought he spotted a village a mile or two at ten o'clock. He realized he was dangerously slow when his Falcon responded sluggishly as he swung the nose toward the church spire on the horizon. He sensed rather than physically checked his heads up display for the direction of north. The low visibility and his general disorientation made it hard to see things early enough to line up the airplane's nose on them.

James rolled out with the town on his nose and peered intently for a woodline to the north. Did he really hear the FAC screaming "... 12 o'clock... woods ..." through the heavy radio jamming ? He saw some scrubby woods slightly to the right, horsed the nose over, and mashed hard on the pickle button. Suddenly lighter by a ton, the Falcon practically rotated about its wingtip as James commanded a tight left turn. Fighting blackout, he saw his wingman curve in behind him toward the fire and smoke made by his cluster bombs.

As if the release of his weapons had suddenly unlocked his brain and clarified the situation for him, Colonel James now saw the battlefield in its component parts -- the enemy battalions advancing in places, halted and firing in others, the friendly forward defenses receiving and answering fire. The battle was now in slow motion. Actually the Falcons had been in the air over the battlefield less than 60 seconds. It seemed much longer. The Colonel felt he could see the flight of each cannon shell, and even the detail of the deadly SAM arcing up toward his wingman's aircraft. He heard his voice making the warning call. It arrived at the same time as the missile.

The exploding Falcon showered the target area with pieces of airplane, bombs, and burning fuel. The slow motion ended abruptly as the Colonel turned to look for a chute and transmitted a fruitless Mayday. During the lonely flight home, Colonel Wesley James wondered how many of his pilots would return to base in the days ahead and whether NATO could win what had started so badly.

The foregoing look into the imaginary near future is not a pretty sight but it isn't too far off the view many fighter pilots hold for the viability of high threat close air support in Europe. (For another experienced airman's perspective I recommend "The Soviet Offensive - An Attack Pilot's View", by Colonel Harry Kieling, in the March-April 1985 Air University Review.) (26:--)

CHAPTER II

THE CAS PROBLEM

The basic problem is that the U.S. and NATO lack the ability to apply safe and effective CAS on large scale.

Considering the Warsaw Pact's significant advantage over NATO ground forces we will probably have to do substantial CAS in Central Europe (as we have in past wars), but the Warsaw Pact air defense threat leads many to believe it can't be done without unacceptable NATO aircraft losses. The Israeli Air Force experience in the costly Yom Kippur War tends to support this view. At the same time, it must be remembered that the Israelis felt they had no choice but to support their army despite high aircraft losses. (24:258-259). I believe that if NATO goes to war we will face a similar problem; we will be forced to do CAS to save our army and accept heavy aircraft losses to modern battlefield defenses. But on top of that, our CAS will not be as effective as it needs to be for many reasons, including lack of suitable munitions, and the pilot's inability to hit the desired target. Perhaps our greatest limitation is the poorly manned and equipped command and control elements (particularly FACs) assigned to coordinate fighter attacks with army fire and maneuver, and the outdated control procedures which make CAS incompatible with modern high threat fighter tactics. One

crucial factor impeding solutions to the overall problem is the lack of consensus within NATO as to whether this lack of CAS ability is really a serious problem or not, given possible alternatives.

Before going into more detail about the problem, let's try to understand what CAS is, and why and where it occurs.

THE CAS AND BAI ENVIRONMENT. When an army is deployed for combat, it establishes boundaries to the front (where the enemy normally is) to help coordinate operations involving subordinate formations, different branches within the Army (such as artillery), and air support from the Air Force. So within the boundaries of a corps, its subordinate divisions, and the divisions' subordinate brigades each have their assigned "turf" to defend and conduct operations within. Any artillery shell or air force bomb falling within that turf has to be coordinated with the ground commander who is assigned that real estate. Only he knows where all his troops are and exactly what part of the enemy he wants artillery or airpower to hit. The forward boundary of this ground commander's immediate area of responsibility is called the fire support coordination line (FSCL). One of the most unambiguous ways to define CAS is to say that all CAS is conducted <u>inside</u> the FSCL. So where is the FSCL ? Unfortunately and inescapably, this is where simplicity departs. The distance of the FSCL from friendly positions is variable. It is determined and published by the senior army

headquarters as often as necessary, typically two or three times a day in NATO exercises. (30:244). The FSCL is based on some reasonable distance (I've seen a little as five, but usually more than ten miles) from friendly troops and the availability of distinctive terrain features near the chosen distance to physically define the FSCL. For example, a river roughly ten miles from the friendly lines could make at least a segment of a typical FSCL. Since friendly positions are seldom convenient straight lines, nor can be the FSCL. Over the years, as artillery has become more powerful and as armies have become much more mobile, the distance of the FSCL from the forward line of friendly troops has tended to grow, representing the ground commander's growing interest in seeing and engaging the enemy at longer ranges. Another factor is that Americans tend to place the FSCL farther into the enemy than do other NATO Allies. Lest we are tempted to visualize CAS only as the attempt to wedge bombs between troops fighting hand to hand, realize CAS can occur inside a FSCL which is as much as 30 miles from the nearest friendly! (30:244). In such a case there would be no practical distinction between CAS and BAI, however, procedurally, the CAS pilots would be required to be talking to the ground forces during their attacks. In fact, since NATO now defines BAI such that it may occur on <u>either</u> side of the FSCL, (as long as the mission is judged not to interfere with friendly fire and maneuver), it is conceivable to have a BAI mission (pilots <u>not</u> speaking to the ground troops or FAC) attacking inside the FSCL

closer to friendlies than a nearby CAS mission ! But having explored these unlikely extremities of the situation, what should we typically expect in the CAS and BAI arena ?

A typical NATO FSCL would probably be about fifteen miles forward of the friendly lines in the case of a defensive battle. The NATO battalion commander fighting defensively, will probably be most critically interested in an economical but rapid reduction of the enemy forces inside of five miles in front of him. The firepower and maneuver of these forces are immediate threats to his troops. (He also knows more enemy forces can be quickly brought forward. He must contain the enemy at all costs, while conserving his strength for a possible counterattack if ordered.) Five miles might also equate roughly to how far he can see, and the range of modern antiarmor missiles and direct fire weapons. A band of two to six miles would probably contain most of the tanks and infantry of the enemy division he is fighting. (This real estate would also contain several hundred ready to fire SAM missiles and AAA guns.) Depending on terrain of course, but typically, the enemy reserves (possibly a fresh division) and most of the division artillery would be located just to the rear, say, 10 to 20 miles from the most forward friendlies. In addition, we expect the Soviets to coordinate the march of powerful (a division with about 300 tanks or an army with about 1000 tanks) second echelon or operational maneuver groups (OMG) from 30 to 60 miles deep to slash through the NATO defenders while they are tied down in combat with first echelon units.

These are the targets and distances we need to think of for our CAS and BAI. CAS needs to be generously provided from about one to five miles in front of friendly forward positions to help dispose of that attacking enemy division as quickly as possible. (Of course, if things go badly and the enemy is overwhelming friendly positions, CAS may have to be applied even closer. The best way to prevent this is to apply the CAS early in the battle and in sufficient amounts to assure success.) While this "close" CAS is going on, we must also hit the enemy forces in depth with a combination of somewhat deeper CAS (outside five miles but still directly controlled by the ground commander on scene) and BAI (inside or outside the FSCL, tasked on a specific enemy target coordinate requested earlier by the ground commander, but without his direct control during the attack). For example, several BAI missions may be attacking enemy artillery positions about ten miles from friendly lines, while the ground commander (through his FAC or attack helicopter pilot) asks a CAS flight to strike an enemy command post vehicle transmitting from a position about six miles from his lines.

> (AUTHOR'S NOTE. I have deliberately avoided the current tendency to portray CAS as exclusively a battle of airplanes against tanks. Of course, the tank is perhaps the most prominent feature of Soviet ground strategy against NATO. Sometimes the tanks will be the ground commander's priority target and we will hit them. But they are numerous and difficult targets. We urgently need better munitions to kill tanks quickly and in large numbers. In the meantime, there are better ways to stop the Soviet advance than devoting our limited airpower to these difficult targets. For example, the accompanying infantry is essential to the Soviet armor advance, yet far more vulnerable to our weapons. The key is that our army commanders facing the

enemy know these priorities and vulnerabilities. We need better command and control to be more responsive to putting weapons exactly where the army wants them.)

When intelligence at army corps level reports the OMG moving toward the battle, the corps would then urgently reorder its priorities to request air attacks (BAI) on this force all along its route of march. The aim is to cut it down to size so that the army and CAS can finally stop it before it can break through into the NATO rear area.

This description hopefully will allow the reader to understand where, why, and how CAS and BAI are employed in an idealized situation. (I must emphasize that these concepts of relative distances are highly variable from individual to individual. I have presented my own here. They can be contrasted with General McPeak's (30:244). The Allies also have other views, which adds to confusion and debate. The U.S. Army would like to buy a missile to go up to 90 miles into the enemy rear to slow down his advancing armies. (50:146). The British think in terms of BAI with fighters perhaps 5 to 60 miles deep. (35:17). (My own view is we should attack the enemy throughout his depth but weight our attacks more as he draws nearer. Inside about 30 miles, time becomes more critical to the enemy commander, increasing the impact of delays we impose on him.)

As we will now discuss, all this is far easier said than done, especially when we consider the numbers of aircraft involved and our limited ability to control them.

MORE DISCUSSION ABOUT THE CAS PROBLEM. The aircraft and munitions we will have for a war in Europe in the near term are not fundamentally different than those we used in Vietnam. BUT the intense air defense threat and to some extent the European weather would appear to force us to use a fundamentally different and more difficult tactical approach. For example, most military planners accept it would be suicidal for an OV-10 FAC to orbit over a Soviet motor rifle division marking targets with his white phosphorus rockets. Nor could four-ships of F-16s set up a wheel at 12,000 feet and roll in on the FAC's smoke.

> (AUTHOR'S NOTE. This might work if we could somehow neutralize the Soviet surface to air missile (SAM) and MiG interceptor threats. However, this would appear to require more suppression assets than we can afford to buy and more time than we can afford to wait before sending our CAS aircraft in after the advancing enemy armies.)

The trouble is, as I tried to illustrate in the opening story and will elaborate further, we haven't developed a very satisfactory European alternative to these Vietnam-style CAS control procedures (FAC and radio). To summarize the very similar observations of several different expert sources; current FAC procedures, only cosmetically altered from Vietnam era, are not compatible with preferred NATO high speed, low altitude fighter CAS tactics. (21:2-5), (25:39-42).

> (AUTHOR'S NOTE. If you want to hear about this in living color and have plenty of time to kill, just ask any NATO attack pilot what he thinks of CAS.)

These difficulties fuel a long-standing debate among soldiers, airmen, and politicians in the United States and abroad, over whether or not CAS continues to be an essential capability. This debate tends to undercut motivation to solve the tough problems our Colonel James and his hapless wingman faced. So as NATO Allies we have sought and grasped alternatives to CAS (such as BAI) which may be based on wishful thinking -- that the army acting alone can stop the first echelon, and the air force acting alone can successfully delay the second. (35:28). (See author's note below). If either or both of those assumptions prove to be incorrect, massive and effective CAS will be urgently called for. At least some of that CAS -- probably the most crucial sorties of all -- will be very close to our own troops. The weapons must fall on target -- on time with no mistakes.

I will present the case that since there is debate over whether we really need this CAS capability (and whether or not we in fact now possess a satisfactory CAS capability) we have not made the required investment to enable us to do CAS safely and in the quantities that may be needed.

> (AUTHOR'S NOTE. The author is aware of the subtle technicalities of Soviet echelonment doctrine in which it is imprecise to refer to "first or second echelons" without further organizational or mission specification. (15:1179). The simple fighter pilot approach to this complex subject is considered adequate for this paper.)

My paper will have served its purpose if the reader stops to ponder: Can the NATO armies hold against the initial onslaught ? Can NATO's air forces disrupt enemy reinforcements ? If not, can

the air forces join in the close battle to save the day ?

Adding fuel to the CAS debate, U.S. Air Force and Army top leaders appear to be in tentative agreement that a missionized variant of the F-16 (being called the A-16) should be the replacement for the A-10 for the CAS and BAI missions. (8:79-80). Our fictional A-16 pilots had a tough time because a new airplane is only a part of the answer to the problem. In fact in some ways the faster A-16 will have more difficulty with CAS than the A-10.

Some critics who believe we need to build a new specialized CAS aircraft say the A-16 will be inadequate for the CAS mission. (8:79). However, TAC's commander, General Robert D. Russ, recently gave TAC's view on the subject, saying,

> There is no way that any aircraft will be able to survive while loitering over the lethal modern battlefield, and the air to ground accuracy of the F-16 at high speed has been amply demonstrated over and over. (9:53).

In these views we have the crux of the problem: we have to go faster doing CAS in order to survive, BUT although the F-16 has proven unprecedented weapons accuracy, that accuracy assumes the pilot knows what to aim at ! Airplanes get the publicity but they can't do their work without the less glamorous but essential command and control systems which tell the pilots where to go and where to aim. We urgently need to do some extensive remodeling of our command and control system, CAS procedures, and training

if we are to make the A-16 (and other NATO fighters) capable of effective CAS on the Central European battlefield.

The remainder of this paper addresses in more detail the debate over CAS, the difficulties and advantages of CAS, and a number of ways to improve our ability to perform effective CAS in European conditions in the near and long term.

THE NATO CAS DEBATE. Many of our NATO Allies, both soldiers and airmen, apparently agree that CAS is impractical or at least not a preferred mission in Central Europe. One researcher found:

> At the present time there are indicators that this system (CAS) might not be a feasible support item in the Central European scenario. These indicators are from a most unusual source, our allies in the NATO forces.
>
> A recent "fact-finding mission" of our Congress uncovered a pessimistic attitude toward the use of close air support when considering engagement of our forces (NATO) against the threat of the Warsaw Pact Nations. (16:1-2).

Although the quoted source is nearly a decade old, attitudes have not materially changed. Early in 1986, Air Vice Marshal J.R. Walker, who at the time was the Royal Air Force equivalent to the commander of the U.S. Air Force Tactical Air Command, said about close air support,

> The Soviets take the air defence of their forward units very seriously and the airman is presented with a problem; to fly survivable profiles while at the same time achieving reliable target acquisition tends to be mutually incompatible. At speeds in excess of 500 knots at 100 feet or so, the tank is a most difficult target. It is small, hard, camouflaged, mobile and at the range at which the pilot needs to first sight it, it subtends the same as a pinhead held at arms length. Add to this the confusion and obscuration, natural and man-made, of

> the active battlefield and, in sum, the result is a sporty contest. (48:16).

Attack pilots, especially among NATO Allies, author many articles critical of CAS. A previous commander of RAF Germany Harriers said, "I would not want Harriers involved in that sort of battle (CAS) except as a last resort or in exceptional circumstances." (35:88).

A senior NATO army officer said:

> The Army would want the Air Force to prevent or delay follow-on forces moving forward to join those at the front. If the Air Force could do that, the land commander would be able to take on the leading elements and even launch counter-attacks. (35:36).

A U.S. Army officer recently wrote that air force CAS is no longer practical or necessary, given the Army's improved attack helicopter capabilities. (2:24). A former FAC and USAF fighter pilot wrote an article with the descriptive title: "Dedicated, Fixed Wing Close Air Support A Bad Idea." (5:46). A senior RAF Officer's Air War College research effort concluded:

> Taking each problem separately, it might have been possible to have made an optimistic assessment of the role of CAS in modern warfare. Taken collectively, however, the problems for fixed-wing aircraft appear insurmountable. (38:49).

Prominent U.S. Defense Department officials show concern over the feasibility of CAS too. Under Secretary of Defense Donald N. Fredricksen said in a recent interview:

> The Israelis have given up on fixed-wing aircraft for CAS and are doing it with helicopters. I'm not ready to do that, but we have a problem. (8:79).

While I agree with these sources that the problems are serious, I am not convinced we will have a choice whether or not to perform CAS with our fast jet fighters in the event of a war in Europe, because we may need so much of it. I believe NATO has given up too soon in trying to find (fund) a satisfactory way to do high threat CAS on large scale.

AN ASSESSMENT OF TODAY'S CAS CAPABILITY. Some may believe we have an adequate CAS capability now. They would point to about seven hundred A-10s, our first and only purpose-built CAS aircraft, of which up to four hundred would probably be earmarked for use in Europe if necessary. (2:21). They would point to the elaborate command and control structures in being to orchestrate CAS in Europe and Korea, and deployable from the U.S. to any troublespot.

Despite misfortunes such as the recent withdrawal of our OV-10 FACs from Europe, compared with our traditional demobilization between wars, today's capability does in fact allow room for some optimism. We recall we began air operations in Vietnam in the mid-60s with a totally inappropriate force structure to provide air support. We had to "borrow" prop-driven Skyraiders to drop weapons close to our troops, and Birddog observation planes for our FACs. It took most of two years to organize the command and control system and develop the procedures which later served the Army so well in that conflict. (47:224). We faced a similar and even more critical situation when fighting broke out in Korea.

We ended up pulling F-51s out of the "boneyard" to perform air support; and soldiers and airmen fighting to maintain a toehold on the peninsula hastily fabricated a very effective air-ground command and control system. Unfortunately, according to an article by a senior Army officer who was directly involved, the Air Force later "upgraded" air support by gradually adding bureaucratic drag devices to the command and control system, and by replacing the F-51s based in Korea with newer, faster (and overall less effective) F-80s based in Japan. (28:75-76). It is tempting to see some uncomfortable parallels with the current move to replace A-10s in Europe with A-16s. But then, the F-51 and F-80 didn't have to face the Soviet Army's integrated air defense system.

The realities are that the A-10 is getting old and more vulnerable to the constantly improving Warsaw Pact air defenses. The A-16 would seem better able to survive using its superior speed and agility. However, it will take a much improved air-ground operations system and better CAS tactics than we are now using in Europe for the A-16 to perform effective CAS and survive. This goes for other NATO "fast jets", too. NATO cannot afford to restrict the CAS mission to the relatively few A-10s. We recall that in Vietnam, although the Skyraider was the CAS weapon of choice, we eventually developed the command and control system that enabled us to do CAS with F-100s, F-4s, F-105s, and even B-52s! (Khe Sahn). (47:49,156). There were times when everything we could put into the air was needed to support our

troops. One thing was evident: we built a very large and effective command and control structure with hundreds of Air Force FACs in the air each day looking for signs of the enemy and listening to the radio network, ready to respond to the Army's call for air support.

> (AUTHOR'S NOTE. I understand that Vietnam was a "different" kind of war, but I find it ironic that with the Warsaw Pact presenting infinitely more powerful opposition to our Army than could the Vietnamese, we seem to be comfortable with our relatively limited NATO CAS capability.)

An excellent and comprehensive study was compiled in 1975 by a number of Air Command and Staff College students who had recent European theater experience as FACs or fighter pilots. Appropriately titled, "How to Improve Close Air Support in Central Europe", the report laid out in great detail and with commendable logic, the many problems that existed at the time: lack of FAC mobility on the battlefield, inadequate FAC-to-fighter communications, shortage of target marking devices, and unrealistic procedures and tactics that were being perpetuated by unrealistic CAS training and exercises. The study went on to propose practical, inexpensive improvements that could be implemented in the near term and have immediate payoffs in capability: improved procedures, tactics, and training for FACs and CAS fighter pilots. (Habedank Study) (21:--).

Another report titled, "Forward Air Control Today: Will it work in Europe?", by a former USAF FAC came out in 1979. Among

its observations: that the FAC force is grossly undermanned; that the FACs lack the appropriate battlefield mobility; that CAS FAC control procedures are not compatible with the high threat tactics of NATO fighters. (25:39-42). Recommendations for improvements followed a similar vein to the 1975 Habedank study.

From my own direct European CAS involvement from 1975 to 1985, I know that no such improvements were ever made except perhaps in isolated cases by individual units. In fact in 1984 Central Europe's only USAF OV-10 FACs were withdrawn from theater, removing a significant portion of NATO's scarce CAS control experience -- the very people whose expertise would be needed to improve CAS procedures, tactics, and training plans. So the CAS capability which was considered inadequate by experts in 1975 and 1979 has further deteriorated.

The U.S. Air Force is pretty well prepared to fight a low intensity conflict using our current CAS capability somewhere like Nicaragua. The A-10 should be very effective and will be able to operate with a minimum of assistance from our current CAS control system. High speed (F-16) fighters can also operate but pilots will require relatively more assistance from the FACs in locating targets. The enemy will no doubt have a number of late model Soviet air defense guns and SAMs, but I believe the numbers will be manageable and we will probably have the luxury and resources to suppress the defenses before applying CAS. Therefore, many of the same procedures and tactics we developed in Vietnam would probably apply.

For the big war in Central Europe which is fortunately less likely than Nicaragua, we're not so capable. The A 10s will be in the inventory for another decade or so, but many doubt they can survive in Europe. (31:30). They do have some things going for them and so they might surprise both the enemy and our own side with their effectiveness and survivability.

> (AUTHOR'S NOTE. Pilots are not as a rule very objective about the strengths and weaknesses of airplanes they have flown for any length of time. I recently flew the A-10 in Europe, so my opinions may be suspect. However, one thing is beyond debate about the widely maligned "Thunderhog": its GAU-8 30 millimeter gatling gun gives it unprecedented kill power for a fighter airplane. It is not just the gun, but a harmonious marriage of aircraft performance and weapon which makes the gun so easy for the pilot to point, fire, and hit a target with devastating results. We need to preserve that lethality and ease of employment in our future fighters.)

The fast fighters should be more survivable than slow ones, but this depends if they can use their speed to advantage, since today's CAS procedures (a FAC with a radio) tend to restrict fighter speed and maneuvering.

It seems that the debate over the viability of CAS is heavily influenced by the air defense threat to our CAS aircraft. The problems and tactics which make CAS much more difficult than in previous wars are forced upon us by the air defenses expected to accompany Soviet armies into battle.

HOW AIR DEFENSES INFLUENCE CAS EMPLOYMENT IN EUROPE.

The most tangible evidence of Soviet high regard for our airpower is the investment they have made in mobile air defense systems to accompany their armies. Interlocking and mutually supporting

threats including up to 12 distinct models of SAMs, thousands of guns, and manned interceptors can all be coordinated against aircraft which dare to approach a Soviet army in the field. The existence of these numerous and varied systems, covering all practical altitudes, with overlapping envelopes, denies us the traditional use of our airborne FACs who were literally indispensible to the air effort in Vietnam and very important to the effort in Korea and WW II.

As a former FAC and widely experienced attack pilot, I felt that CAS-specialized A-10 pilots, based in Europe could possibly do CAS without a FAC under ideal conditions. But certainly this would not be feasible for most faster NATO fighters whose crews are not CAS specialists. Moreover, the too few ground FACs assigned to army units lack mobility to get to the best vantage point to observe the target and direct the attack. (One study seriously recommended FACs be issued light motorcycles!) (21:96). Even if the FAC is able to be in the right spot at the right time, we expect heavy radio jamming to limit communication between FAC and fighter pilot. We expect our frequencies to be jammed intentionally by the enemy and unintentionally by overuse by our own side. Even if our (U.S. only) jam-resistent "Have Quick" radios beat the enemy jammers, we still have limited line of sight radio range with the FAC on the ground and the fighters needing to stay low to survive. So given a combination of all these problems, NATO CAS could be crippled, (or more accurately, stillborn).

The air defense threat dictates that our CAS fighters must hug the ground and use high speed hit and run tactics in order to survive. This is the usual tactic for interdiction missions where friendly troops are not a factor, but to perform CAS the fighter pilot must first learn where the enemy targets and friendly positions are just prior to the attack. We haven't come up with better ways to do that than to have the FAC explain it to the fighter pilot over the radio -- just like Vietnam.

> (AUTHOR'S NOTE. We can foresee the day when emerging technologies will enable us to provide the fighter pilot with the necessary information in other ways. I provide a glimpse into this future later in the paper. But for the near future, the radio and the FAC remain essential to CAS.)

During the FAC target briefing process, "task saturation" becomes a deadly problem for the single-seat fighter pilot. He is skimming the trees, trying to look over at the battlefield in the distance and relate landmarks to his map, listening intently to the vital instructions of the forward air controller, watching out for his fellow pilots who are engaged in the same frantic activity, and not least, keeping a sharp eye out for SAMs, AAA, or MiGs. Many a pilot will spend one second too long looking at his map or over his shoulder and never know what hit him as his airplane plows into the countryside.

Then during the attack itself the CAS pilot must positively identify his target and keep his weapons safely clear of friendlies. This additional demand on the pilot's concentration further limits his ability to see and evade air defenses. Often

he must float high and slow down while he makes sure of his attack, presenting an easier target for enemy SAMs and AAA.

We either have to reduce the threat, improve tactics, or find some totally new approach. So far we appear to be simply ignoring the problem.

CHAPTER III

CLOSE AIR SUPPORT VS. BATTLEFIELD AIR INTERDICTION

One way NATO has sidestepped the CAS issue is to emphasize BAI hoping this will offset the need for CAS.

> (AUTHOR'S NOTE. The author does not mean to appear to accuse NATO of some sinister plot. Given the very real problems, smart and well-meaning military and civilian leaders and strategists believe this is the best way to attack the problem. I simply believe it flies in the face of historical precedent to hold that we will not provide substantial close air support to our armies on the battlefield. In the event of war, I believe we will find very early on that we misjudged in this area of current doctrinal thinking.)

THE NATO PREFERENCE FOR BAI. I know from personal experience that most NATO pilots who practice high speed very low altitude attack runs using rudimentary FAC procedures and radio equipment, do not enjoy a high mission success rate, and they "feel" vulnerable as they scan for the target. I believe this explains why many NATO attack pilots, are critics of high-threat CAS and ask themselves -- is there an alternative to CAS ? This kind of pilot thinking, combined with growing concern within the NATO armies about the Soviet doctrine of echelonment, led to the creation of battlefield air interdiction (BAI) as a NATO mission. The target is the same as in CAS -- the enemy army. But in BAI

the enemy is struck at a safe distance from friendly lines, say, 10 to 20 miles, and perhaps as deep as 60 miles. (35:17). BAI advocates believe this to be a way of delivering telling blows against enemy armies without the difficult close coordination required when bombing and strafing close to friendly troops. (35:88). They believe the main task of tactical airpower is to delay the advancing army, upsetting the enemy's critical timetable for reinforcing his forward units. Experts in Soviet doctrine calculate this will frustrate enemy ability to carry out his fundamental wartime objectives. (35:30).

The pilots who prefer BAI missions to CAS argue that they can more completely plan their mission and tactics, rather than having to rely almost totally on a FAC. They believe the BAI mission will be more like pure interdiction in that the position of the target can be predicted before takeoff so an optimum attack can be preplanned to take full account of terrain cover, sun position, and known threats. The other members of the flight can be given preassigned targets and attack geometry. Unlike CAS there should be no need to coordinate over the radio in target area. Since there are no friendly troops in the area, tactics need not be restricted and a greater number of aircraft can be used to add destructiveness while saturating air defenses. Although I am advocating CAS here, I see value and advantage in BAI too. The enemy should not enjoy a "free ride" into battle. But I believe we have to analyze BAI to see what we get for what we have to pay compared to CAS.

HOW MUCH BAI VS. HOW MUCH CAS ? There appears to be a growing consensus among Allied airmen and soldiers that the armies can win the battle with the first echelon without (significant) CAS IF the air force can delay the second echelon. For example, British Army General Nigel Bagnall, a previous commander of NATO's Northern Army Group was quoted as saying:

> He (the Army) would defeat (the enemy) first echelon but he needed (the Air Force) to prevent the enemy from reinforcing in the battle area. ... he accepted that it could mean that during the initial days of the conflict his troops might not see a single friendly attack aircraft other than those passing through their area at high speed on their way to (deep targets). (35:28).

In this view, the British Army and Royal Air Force appear to be perfectly in tune. RAF Strike Command's Air Vice Marshal Walker recently said,

> ...as technology has favoured the anti-aircraft defence over the close air support aircraft during the past few years, so it has been necessary to use CAS sparingly if flexible air assets were not to be squandered. Both COMTWOATAF and COMNORTHAG, from this stage, have reiterated that while CAS will be provided in the extreme situation, under modern conditions airpower is best utilised elsewhere. (48:16).

We hear the same from U.S. Army generals when they address operations in NATO or other theaters. But is it reasonable for the NATO armies to believe they can hold without early and substantial close air support ? For evidence that the NATO armies may have too much on their plates, we need only refer to unclassified lists of forces. For example, the Soviets maintain twenty first line divisions in East Germany, and can fairly quickly match that number with reinforcements in Western

U.S.S.R., to say nothing of similar numbers of non-Soviet Warsaw Pact divisions in East Germany, Poland , and Czechoslovakia. (6:236-238).

NATO may be able to muster nearly as many total troops given plenty of warning, but two- or three-to-one imbalances in tanks and artillery are well-publicized NATO deficiencies. Equally well known is the problem of especially thin defenses on certain key portions of the NATO front line.

Given the size and firepower of the opposing forces, one then has to look at the likely Soviet objectives. We can expect they would take the form of a powerful and rapid thrust across Germany to present NATO with a fatal fait accompli before NATO can gather its strength and organize the kind of campaign which defeated Hitler. The North German Plain would seem to provide a relatively clear route for the highly mechanized Soviet armies. Therefore time and the relatively short distances the Soviets have to cover to achieve victory, work against NATO defensive plans. One of the West's leading authorities on Soviet military strategy, Britain's C.N. Donnelly, describes the Soviet operational maneuver group as, "...the all-important link between (Soviet) strategy and tactics. It is a means to an end, the end being the rapid collapse of NATO..." (15:1184).

NATO makes no secret of relying upon airpower to block Soviet success. Throughout its brief but eventful history, the unique characteristics of airpower have influenced the conduct and outcome of war. One of the most recent of many such examples was

the action of the Israeli Air Force in the 1973 War, described here by Roswell Freedman:

> ...the Middle East War revealed the essential role of air support of the land campaign in a short, high-intensity conflict. For 20 days, one crisis situation followed another. In fact, at certain times, these emergencies occurred simultaneously on Israel's two widely separated frontiers. In these situations, only airpower possessed the necessary qualities of flexibility and mobility to be able to be shifted from one distant battlefield to another in sufficient time and force to provide the margin for victory. (19:337).

C.N. Donnelly believes it is particularly important for NATO to achieve some <u>early</u> success in stopping the Soviet armored attack.

> Soviet military doctrine holds that if war breaks out in Europe, it must be won very quickly by the Soviet Union if it is to be won at all. If the war drags on, there is a high risk that:
> (a) it will develop into a catastrophic nuclear exchange; and/or (b) the strains of war will destroy the Soviet Bloc from the inside. (15:1177).

The conclusion one should draw from this is that it is vital to deny the Soviets early successes that would encourage them to continue the war on NATO, and perhaps expand their aims. We should also conclude that airpower has a key role to play in stopping the Soviet Army.

> (AUTHOR'S NOTE. If you followed me to this point, reader, welcome to the key to my thesis: I am not advocating a certain percentage of CAS everyday -- although one expects that to occur -- I am advocating that NATO fix the problems and give CINCENT <u>the option</u> of deciding on the morning of Day 2 or Day 3, to discontinue all other offensive operations and devote all sorties for the entire morning to CAS (and BAI) to <u>guarantee</u> a successful stand by our armies. Why ?
> <u>It is of STRATEGIC importance that Soviet armies meet with an unexpected lack of success at the front early in the conflict</u>. Experts on the Soviet military believe such lack of success could cause the early collapse of the Warsaw Pact. (15:1177).
> The use of mass, rather than just A-10s, would

enable our aircraft to overwhelm, if for a brief time, the vaunted Soviet battlefield air defenses. This is why our C3 needs to be expanded and made more efficient and why every NATO attack fighter, not just the A-10, needs to be capable of effective CAS.)

Even if the NATO armies are successful in fighting the first echelon to a standstill, it is still open to question whether the NATO air forces can hold up their end of the deal and disrupt the follow on forces.

What is our airpower potential against the second echelon ? Airpower can be very effective in interdicting modern lines of communications, as it was when Allied fighters and bombers practically sterilized the approaches to the Normandy beachhead prior to and after D-Day in 1944. However, this required a massive and continuous effort, only possible after years of building up Allied air forces to enormous strength, while Nazi strength was declining. (29:374). Also we enjoyed air superiority over Northern France to the extent that the Germans had 119 fighters based along the Channel while the Allies had about 5000. (41:482).

We also recall that our efforts to interdict in Korea and Vietnam fell short of expectations, probably just because we underestimated the scale of airpower required. As a further indication, a recent West German defense study estimated it would take as many as 2200 attack sorties to destroy 60 percent of a single Soviet division! (It should be noted that this assumes the attacking aircraft carry general purpose bombs as opposed to the

newer family of anti-armor cluster bombs. The newer weapons are in relatively short supply, but if used, would reduce sorties required to as few as 220 under ideal conditions.) (34:133). On the basis of such information, the prudent air planner might therefore use 500 to 1000 sorties, obviously depending upon type aircraft and conditions, as a starting point in planning the destruction of a Soviet division.

Using gross unclassified numbers which are good enough for our purposes, CINCENT (assuming full U.S. augmentation) should have about 2000 attack-capable aircraft which could provide him with about 4000 to 6000 attack sorties daily. (22:336). (Without U.S. augmentation those numbers would be roughly half). Obviously, Soviet divisions would not be the only priority targets competing for these attack sorties. Some studies portray second echelon forces as relatively lucrative targets and less intensively defended than those engaged on the battlefield. (30:245). However, other defense analysts point out:

> ... "as penetration distances to targets increase, acquisition capability and weapons effectiveness severely decrease. ... because rear area forces are not as constrained by terrain as those in direct combat, and they can disperse, hide,... making them difficult to find and destroy. The long distances involved also afford better warning and defenses, since attackers must run the depth of the SAM/AAA/fighter gauntlet. (34:133).

Given the previously stated estimates of sorties required to do substantial damage to a Soviet division, and the limited time available to inflict that damage, one can safely conclude that the ability of Central Region airpower to disrupt the second

echelon to the army's satisfaction is, to say the least, in some doubt. This is not to say we should forego BAI, but we should have a realistic handle on the possible results. If so, we would conclude that relatively significant numbers of second echelon forces would probably "leak through" our BAI and produce a greater requirement for CAS than is now available, and more than NATO apparently believes is needed.

BAI VS. CAS : COSTS AND BENEFITS. Let's take a closer look at the similarities and differences between these two related missions. The targets are the same -- the enemy army (to include fixed targets such as bridges or road surfaces used by the army). The air defenses should therefore be the same also, but since the setting is different we should expect the deployment and tactics of the air defenses may be different. If the enemy army is on the move in the rear toward the front, some of the accompanying SAM and AAA vehicles will be in convoy and not ready for immediate action. (The commander will probably deploy a percentage of his air defenses along his route of march or higher headquarters may protect a route being used by a number of subordinate units. Even if they don't start the war that way, they will certainly respond when we begin attacking their columns.) Since we expect <u>all</u> of a unit's air defenses to be fully deployed and alert when battle is joined at the front, BAI advocates argue that relatively fewer defenses are likely to be encountered when attacking enemy columns in the rear area than in the battlefield CAS situation. This may turn out to be true.

However, flying near friendly troops does have certain advantages when considering enemy air defense threats. For one thing friendly army units can provide suppression of enemy air defenses with artillery, tank fire, or armed helicopters. In fact, specific joint doctrine exists to that effect between the U.S. Army and Air Force. (17:50). Similar if less formal understandings exist between armies and air forces of our NATO Allies. (35:32). Even when specific suppressive fires are not available, the mere fact that two armies are engaged in battle will tend to degrade air defenses. Visibility will drop in smoke and dust, communications may be strained, and resupply of missiles and ammunition under fire will be a problem. The enemy is less affected by such problems while moving through his relatively secure rear area. In that case, the defenses can devote their undivided attention to the attacking aircraft and enjoy a better chance of shooting them down.

Another advantage of operating near friendly troops who can observe the enemy is that we gain better current intelligence than is possible in the enemy rear area. BAI attacks may encounter unexpected units and more air defenses, or fail to locate their targets on the expected route. (34:133).

The other key difference between CAS and BAI has to do with airpower's ability to achieve the desired results. There is a tendency for airmen to overestimate the effects of air weapons. They can be devastating under ideal conditions and when the right weapon (like an incendiary fragmentation bomb) is used against

the right target (like the "paper" housing communities of Tokyo). But generally, our conventional air weapons are not very effective in wiping out large numbers of well trained troops and their rugged combat vehicles. (History is full of examples of the destructiveness of airpower, but the reader must consider the nature of the target and the weight of attack. To shatter two North Vietnamese divisions around Khe Sahn in 1968 required some 24,000 tactical air sorties and 2700 B-52 strikes over two and a half months around the clock. Some 110,000 tons of ordnance rained down around Khe Sahn.) (47:52). A study of data from World War II, Korea, Vietnam, and the 1973 Arab-Israeli War concluded that approximately 30 aircraft sorties are required to destroy a tank, and about 5 tons of ordnance is expended for every soldier killed. (42:4,6). We have previously mentioned the study which estimated at least 220 and perhaps 2200 sorties to destroy only 60 percent of a Soviet division. (34:133).

These statistics should tell us that airpower's true value may not be in its ability to economically destroy targets independent of other forces, and that success in interdiction (or BAI) relies upon massive and relentless attacks. It may be not practical for us to contemplate such a level of effort in the early stages of a major war in Central Europe. This also brings up the question of what differing effect it has on the enemy if we kill a number of his tanks on the battlefield as opposed to killing those same tanks in the rear area before they can be moved into battle. I believe the answer lies in an analysis of psychological impact.

THE PSYCHOLOGICAL IMPACT OF AIRPOWER. It may be that airpower's primary impact on the enemy is psychological. This impact may be effective even if actual enemy losses are a small percentage of his force. (17:94). One of the most recent examples is related by one of Britain's top ranking airman, Air Chief Marshal Sir Keith Williamson:

> ...one of the major players in the ground battle for Goose Green ... told me that it was the arrival of the Harriers dropping cluster bombs that, in his opinion, finally convinced that large force of Argentinians (sic) to surrender--it was not apparently so much what the attack achieved in military terms but rather the psychological effect of this display of impressive firepower... (49:34).

It is vital that we airmen understand and exploit this psychological effect. It is also important for us to know airpower's limitations. Throughout history we have tended to oversell ourselves and others on the effects of air attacks. The effects of an airstrike on a military unit are often temporary. When the planes leave, the soldiers pick themselves up off the ground, tend to the wounded, bag their dead, and survey damaged equipment. After a few minutes or hours the unit can usually resume march. Even large civilian population centers (London- 1940, Berlin 1945) showed astonishing resilience to aerial bombardment. When the results were in from efforts such as our interdiction efforts in Korea and Laos, we were disappointed and the Air Force lost credibility simply because we had unrealistic expectations for the results given the level of effort, and perhaps more importantly, we forgot the importance of "cooperating ground forces" for successful interdiction.(33:643).

In his rear areas, an enemy army unit will normally have time to regroup after an air attack before being challenged on the battlefield. The situation is different if the air attack occurs while enemy troops are already engaged in battle with our own. Our exercise of air superiority tends to demoralize and frustrate the enemy. Given the same level of casualties and damage from air attack, the enemy troops engaged in battle may not be given the chance to recover their poise and should become less effective against our own troops and more vulnerable to defeat if our troops move to exploit their advantage.

I observed firsthand as a FAC early in my military career that airplanes could achieve effects out of proportion to their actual destructive power. For example, lightly armed propeller driven fighters sometimes discouraged advances of regular North Vietnamese units in Vietnam and Laos. Friendly troops were encouraged when they saw their own airplanes harassing the enemy. I observed a number of occasions when bold and persistent CAS attacks seemed to inspire a beaten ground unit to intensify their fighting and regain lost ground. As Freedman points out in his review of airpower through four wars: "Another sound principle of airpower employment proven anew was that in order for close air support and interdiction operations to be decisive, they must be associated with an active ground situation." (19:336).

This brings up a final important point. If we wait until our friendlies are exhausted to apply CAS, we do not have an "active ground situation", which can exploit the CAS and be

decisive on the battlefield. We in the U.S. Air Force, and even moreso among NATO Allies, tend to think of CAS as an emergency procedure - a rescue mission -- to save an all but defeated army unit. This in itself is a reflection of the nonroutine nature of CAS. It is seen as a last resort because it is not easy for the Air Force and Army to work together routinely on the battlefield. But if we could, we could multiply our respective combat power, and reduce our respective weaknesses. We could give an opposing army a very difficult problem: defending against simultaneous attacks from the ground and air "flanks". This proactive rather than reactive use of airpower in the close ground battle would enjoy the benefit of synergism from a fresh and undefeated ground force capable of exploiting a massive, well integrated CAS (and BAI) effort. We can't do this smooth air-ground integration now. I believe I've provided ample evidence that many military leaders don't even think it's a worthwhile goal to work toward.

In summary, it is important to attack the enemy throughout the depth of his deployment with CAS, BAI, and interdiction. But we should not delude ourselves about the payoffs and costs of these missions. BAI in the quantities we can apply, may not be enough to have the required effect on the second echelon. In CAS, the proximity of friendly forces to exploit the enemy's temporary disorientation after an air attack can lead to a decisive enemy defeat on the battlefield. This can best be done through the early, massive, and well coordinated application of CAS along with army fire and maneuver.

My own prejudices are evident in the preceding discussion.

(1) The value of synergism in combined (air - ground) attacks

(2) The primacy of psychological effects of air attacks

CAS seems to provide more opportunity for these effects than does BAI or interdiction. While hardly anyone believes that an excellent CAS capability would substitute for the need to perform BAI, it seems that many are prepared to accept that adequate BAI would obviate the need for CAS. This belief is very convenient since a viable CAS capability seems to be so much more difficult to field, but I believe we need <u>both</u> capabilities -- that one is not an adequate substitute for the other. Nor should we forget the important contribution interdiction can make when it is properly folded in to the overall campaign strategy.

INTERIM SUMMARY.

To this point I have discussed the debate over whether or not we need to be able to apply CAS, and if so, how much, and the reasons why. I have asserted that command and control is a major limitation, restricting how much CAS we can do and how well we do it. It remains for us to look in more detail at command and control in the fighter CAS context, and the broad range of needs and alternatives for improving the situation.

CHAPTER IV

COMMAND, CONTROL, AND COMMUNICATIONS (C3)

CAS AIRCRAFT AND CONTROL : INTERDEPENDENT ELEMENTS. If we wanted to devise a theoretical model of a CAS system, we could picture effective CAS as a function of two major interdependent elements, each of which is a system of subelements. One element is the weapon system, including the aircraft, avionics, munitions, and not least, the aircrew. The other element is the control system, including the people, communications, computers, procedures, and sensors which combine to tell the CAS pilot where to go, where the target is, and help him survive the air defenses. (The Habedank Study breaks the process down further into a number of interdependent activities rather than two major elements, but our basic conclusions are similar. (21:--).

The U.S. Air Force command and control system is known as the Tactical Air Control System (TACS). It encompasses everything from the air component commander's HQ to the radars that control our interceptors. Although it has a much broader mission than simply the control of CAS, FACs are a part of the TACS. The applicable portions of the TACS go with the U.S. Air Force wherever we deploy, and are operating permanently in Europe and the Pacific in support of U.S. and Allied forces.

These two major elements: the weapon system and the control system are interdependent in that if we deploy a very smart airplane avionics combination, it requires a particular kind of

service from the C3 system that we would expect to be different than a less sophisticated aircraft would need. For example, the advanced aircraft might need only target coordinates to ten digit accuracy while the other needs a verbal target description. A good C3 system is able to provide whatever the various aircraft need for their missions -- maybe thousands of sorties in a few hours !

For some years now many of our experts in the field have been saying that existing C3 capacity is unable to provide services to exploit the full design capabilities of many of our U.S. and Allied aircraft. (21:2-5), (25:39-42). Let's look in more detail at the things our fighter pilots need the C3 system to do for them.

THE SPECIAL PROBLEM OF TARGET ACQUISITION.

The Interface Task Force conducted a "Special Study on Forward Air Controller/Forward Observer" in 1975. One of their key findings supports the underlying premise of my argument.

> Timely and precise target identification to the fighter pilot is the single most important factor in the effective application of CAS. (36:58).

When a flight of fighters come work for them, the army troops and even the Air Force FAC who may not be a fighter pilot himself, find it hard to believe that these jet jockeys can't see the enemy troops and vehicles which appear so obvious to our own soldiers. The reasons for this are a bit technical but important to understand.

First of all, assuming he comes in low and fast, the fighter pilot doesn't have as much time as someone standing on the ground to look around and orient himself. He doesn't know exactly what he's looking for or exactly where to look. And he's chewing up ground at 500 to 800 feet per second. Unless the target happens to be dead ahead when he sees it, the pilot needs an between two and five seconds to bring his nose in line with the target. Then he needs another one or two seconds to stabilize his aim. For most weapons, release occurs when the aircraft is between 3000 and 5000 feet from the target. Converting speeds of between 350 and 500 knots into distance, the fighter pilot needs to see his target from an absolute minimum of 1 mile and normally at least 2 miles away. It is relatively easy to see a dark tank moving on white desert sand if the land is flat and the visibility is unlimited. But in Central Europe we expect green or brown tanks will be hard to distinguish from foliage, especially in Europe's typical three miles flight visibility. Experienced pilots would probably agree that they are lucky to recognize a tank at more than one and a half miles away. This is supported by a study on European CAS done in 1975 which concluded that typical (tank or truck) CAS targets are seen at a maximum of one to two miles. (21:75). This leaves the pilot zero margin for error. (It so happens that the A-10 with its relatively slower speed coupled with rapid turn rate and ease of aiming the gun, can react to targets seen as close as one mile. Most faster aircraft pilots need to recognize their target out to two miles

to be able to successfully attack. This helps explain the importance of aircraft design and speed as it relates to CAS.) All this means that when the fighter pilot first appears on the horizon, he has only 3 to 5 seconds to scan several square miles of countryside, recognize his target, swing his nose on it, aim his weapons and fire. It may be very difficult in those few seconds to decide which targets are enemy and friendly, which enemy targets are still operating, and which of those is of primary interest to the embattled army commander. (It is often hard for CAS pilots to accept that it makes a big difference to the Army WHICH tank they kill. The army needs to selectively kill the commanders' vehicles -- the ones with the radio antennae ! The army would probably be horrified to know that the average fighter jock is lucky to see a tank's gun much less a radio antenna from his firing range.)

> (AUTHOR'S NOTE. Again, we are assuming that the fighter pilot must see what he's shooting at in order to perform effective and safe CAS. That's our aviation experience to date. Technology exists to accurately attack targets the pilot cannot actually see, but such systems are not widely available, and have not so far been considered practical for CAS.)

The bottom line once again, is that the fighter pilot needs help from the people on the scene. And that help has to be timely and tailored to his personal needs if he is to be able to come in with speed and surprise and still quickly locate the correct target.

CAS C3 TASKS AND PROBLEMS. When we think about C3 we should include all the following aspects:

(1) Processing and presentation of information to senior commanders and staff for battle management decisions. (Requires comprehensive, accurate, and current information, presented in correct perspective.) In relation to other mission priorities, HOW MUCH CAS/BAI needed ? Where ?

(2) Preparation and transmission of orders to subordinate commands and units. (Requires up to date insight into capabilities and limitations of each subordinate unit and prompt, unambiguous orders passed by reliable communication means. Implies ability to adjust previous orders in timely manner to meet changing situations.)

(3) Tactical battle coordination during execution. (Requires organization and equipment to see the developments on the battlefield and interact with the engaged forces. Most important examples of forces for CAS are army unit being supported, and CAS fighters. Examples of battle coordinators are FACs, and tactical air control parties at army brigade and division level. Examples of equipment are radios and laser target designation devices.) Although these first two aspects are crucially important, and treated peripherally, this paper focuses on the third element which directly interacts with the fighter pilot once he has been dispatched to the battle area.

As we look at future alternatives, the reader should bear in mind the difficulties we discussed earlier -- too few FACs (who often

can't see either their targets or fighters) trying to control too many fighters, relying upon unreliable radio communication and inadequate target marking means.

> (AUTHOR'S NOTE. Nothing carved in doctrinal stone specifically requires the use of a FAC for CAS, but throughout the brief history of airpower to date, they have been reinvented in every war by almost every warring nation to enable their fighters and bombers to safely drop weapons near friendly troops. Maybe technology will soon replace the FAC, but the fact remains that the fighter pilot needs help of some special kind hitting the army's target.... and only the target. Right now, the FAC with his radio is all we have to control the bulk of NATO fighter CAS.)

Into this marginal C3 situation we propose to introduce the new generation of high performance NATO fighters, such as the A-16, which place an even greater strain on this limited C3 capability. Before we can capitalize on the improved performance of the A-16 in the CAS role, we have to address those C3 problems, especially those that prevent the fighter pilot from finding his target while flying his optimum tactics.

As we've discussed, the current CAS procedures practically force our fast fighters to slow down, climb, and linger in the target area in order to sight their targets. This gives the enemy air defenses more and better shots.

This is clearly a case of the outdated control system negating the evolution of the weapon system. (The A-10 is also impacted by the control system but not nearly so much as the faster fighters and those that do not specialize in CAS.) It seems in order to improve the CAS effectiveness and survivability of the

faster A-16 we need to focus our attention on improving our rickety control system.

CHAPTER V

EXPLORING SOLUTIONS

My objective in this paper is not to plug a particular piece of gear or idea so much as to promote a general acceptance of the continuing need for the U.S. Air Force and our Allies to be able to provide close air support for as long as we continue to have armies. Someday we may do very precise and effective CAS from Earth orbit, using the sensors, communications, and phaser beams of a Starship Enterprize -- and it isn't too early to be working on it.

At the same time we have to use gear we have right now or hope to have in the near future in the best possible way to support the Army in Europe, Korea, the Middle East, or Nicaragua. As the Soviets deploy more and better SAMs and sell them to more clients, our current way of doing business is becoming obsolete (some say USAF CAS has been obsolete for years because they assume the way we did CAS in Vietnam is the only way to do CAS). Innovative procedures and tactics can be very effective, inexpensive, and immediately available. This approach relies on enough highly experienced people focused on the problem.

The next paragraphs assess a range of alternatives for addressing our CAS problems.

A VISION OF CAS IN THE FUTURE.

Imagine, with the right combination of communications, sensors, avionics, and munitions, an A-16, (or F-111, or B-1 bomber) or

other NATO fighter, could come in on the deck, near supersonic speed, day or night, in any weather, release dumb or smart weapons on the precise target desired by the ground commander, within minutes of the ground commander's request for air, without talking to anyone on the radio.

Such a control system might work something like this. The senior joint headquarters would have a master display continuously updated by reliable all-source intelligence, including advanced systems such as Joint Surveillance and Target Attack Radar System (JSTARS), showing friendly and enemy ground, air, and naval forces, enabling commanders to make quick and accurate decisions about force apportionments and allocations. This would be supported by state of the art data automation. Reliable and current information for the commander and staffs would reduce the current uncertainty about how much CAS to provide and where to send it. Better situation awareness at the headquarters should speed decisions and earlier orders to the field. Missions could be planned earlier and the crews better prepared. Rapid communications throughout the network would allow smooth adjustments to a changing situation. Next, as the fighters and bombers head for their targets they would be guided by their reliable and accurate onboard navigation computers automatically updated by jam-resistant data link as target information is refined by the ground forces near the target. The only action required by the ground forces is to aim a passive sensor-designator on the desired target which automatically and

continuously updates precise target position through a system such as the Global Positioning System (GPS) and passed instantly and automatically to HQ display boards and the assigned CAS aircraft navigation computer through a secure, unjammable data link such as the Joint Tactical Information Distribution System (JTIDS). The CAS pilot's display system would continuously show him bearing and distance to the target, and any weapon delivery or enemy threat data affecting his mission. It would not be necessary to talk on the radio because all information and attack authorization can be received by data link and displayed on cockpit instruments. The CAS aircraft's unique identification system would be continuously tracked by the airborne warning and control system (AWACS) and displayed in the HQ as well as all friendly air defense centers and the supported ground commander's display. As the aircraft approach, all the ground troops have to do is hold the designator on the target and all the CAS pilot has to do is follow his computer display and give his consent to the automatic release of his weapons. He may never even actually see the target ! The system would be accurate and reliable enough that neither the ground commander nor the CAS pilot would be concerned about missing the target and endangering friendly troops. The pilot could approach at any speed and altitude and perform violent evasive maneuvers. The system would give him the flexibility to react to defenses at any time and provide steering for the least risk escape from the area. The control system would have the capacity to coordinate the individual attacks of a

large number of aircraft on the target, even if their pilots couldn't see or talk to each other, such as at night or in weather !

If we could field such a control system to match our weapon system evolution, any aircraft with the right avionics equipment could do CAS (and other missions, too) without the current clumsy and vulnerable procedures that plagued our Colonel James. His story might then be very different. Let's join him again.

> Colonel Wes James advanced the throttle to idle as he saw the flashing "LAUNCH FOR CAS" message on his JTIDS message placard. Simultaneously, his crew chief pressed a button to open the massive doors of the hardened aircraft shelter. The shelter's lights automatically dimmed leaving James bathed in the soft colored glow of his cockpit instrument lighting. It was unusual for a senior officer to have himself scheduled for night CAS alert but Wesley James was an unusual deputy commander for operations. He wanted to see for himself this latest A-16 CAS modification package.
>
> The war in Central Europe had passed the crucial stage after the first 15 days of intense fighting. Although NATO forces were hanging on by their fingernails, the Soviets were denied the easy march to the Channel and the Rhine they had counted on. Now the grim job of restoring the West German borders was in its third week. While the politicians talked and the Soviets stonewalled, NATO soldiers and aircrews continued to die.
>
> In his previous tour at the system program office, James had helped to engineer portions of the system he was testing tonight. Essentially this was the long awaited integration of Joint Tactical Information Distribution System (JTIDS) and the A-16's navigation and attack computer. JTIDS and the supporting systems such as Global Positioning System (GPS) had been operational for only six months before the war broke out. The learning curve was still vertical. The initial effort was focused on integrating the system in U.S. and NATO command centers. Now sufficient terminal kits were available to install in tactical unit ops centers, army command vehicles, and air force tactical aircraft. (See Figure 1 - JTIDS Diagram)
>
> Yesterday the first four Falcons of Hahn's 50th TFW

had completed modification. Pilots were ecstatic after the first day missions flown this afternoon. James had listened carefully to their animated descriptions of how they arranged their switches and used the various cockpit displays to receive current and precise target and threat information specifically focused on their individual aircraft and mission. James decided then and there he and one of his young flight commanders would try the system tonight. Officially, the A-16 carrying a Low Altitude Navigation and Targeting Infra Red for Night (LANTIRN) pod was capable of night CAS missions. These were always flown single ship and considered highly risky by the pilots. JTIDS with GPS data should enable pilots to fly loose formation without having visual contact with the leader of the formation. That among many other things would be tested tonight.

As he taxied, James called up various cockpit displays and briefed himself on his assigned target and nearby air defenses. He selected 1:50,000 map scale on the large moving map display on his instrument panel. A red-coded electronic trace etched the traditional triangle symbol over the target situated on the western edge of a square-shaped area of woods. A digital message specified the target: "DIV COMMAND POST". Selecting magnification, James studied the terrain contours noting a gentle slope up to the target from the west, his likely attack direction. In addition to the red triangle, three irregular green shapes contained the letter "F" signifying friendly troop positions eight kilometers west of the target. Hardly "close", mused James, but well inside the bold purple line that represented the fire support coordination line (FSCL) which formally defined this as a CAS mission, and made his jet a tool in the hands of the ground commander. There were also a number of small red circles near the target representing last known positions of enemy SAMs and AAA guns.
All this information was being constantly updated throughout the system and updates instantly appeared on his map and heads up display.

As the two Falcons turned onto the runway, James moved a switch which caused a computer to trace on his map the optimum attack axis and best escape heading off target. James could override the recommendation if he chose, but it represented a distillation of all known intelligence and analysis of terrain. (See Figure 2 moving map).

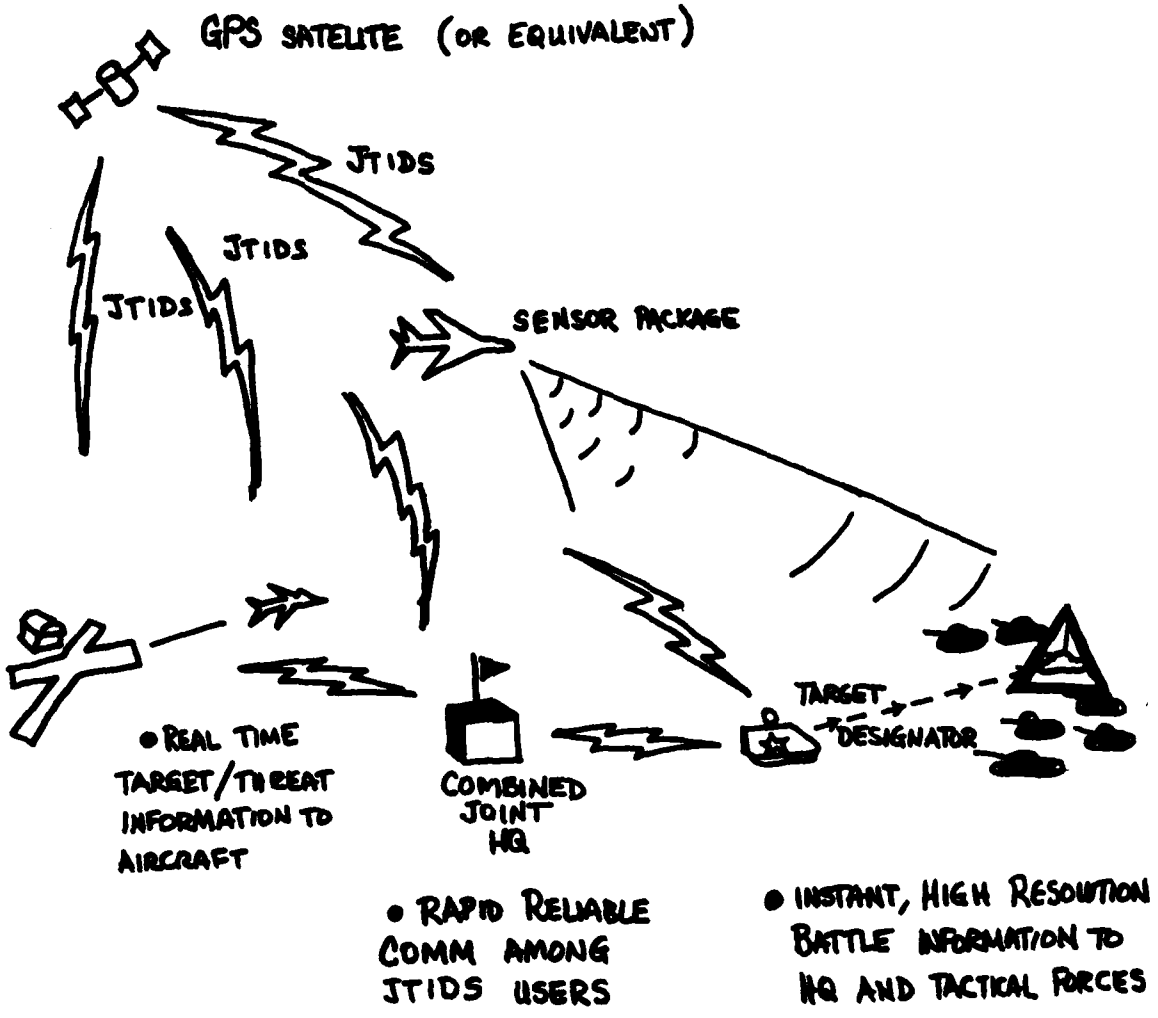


Figure 1 - JTIDS DIAGRAM

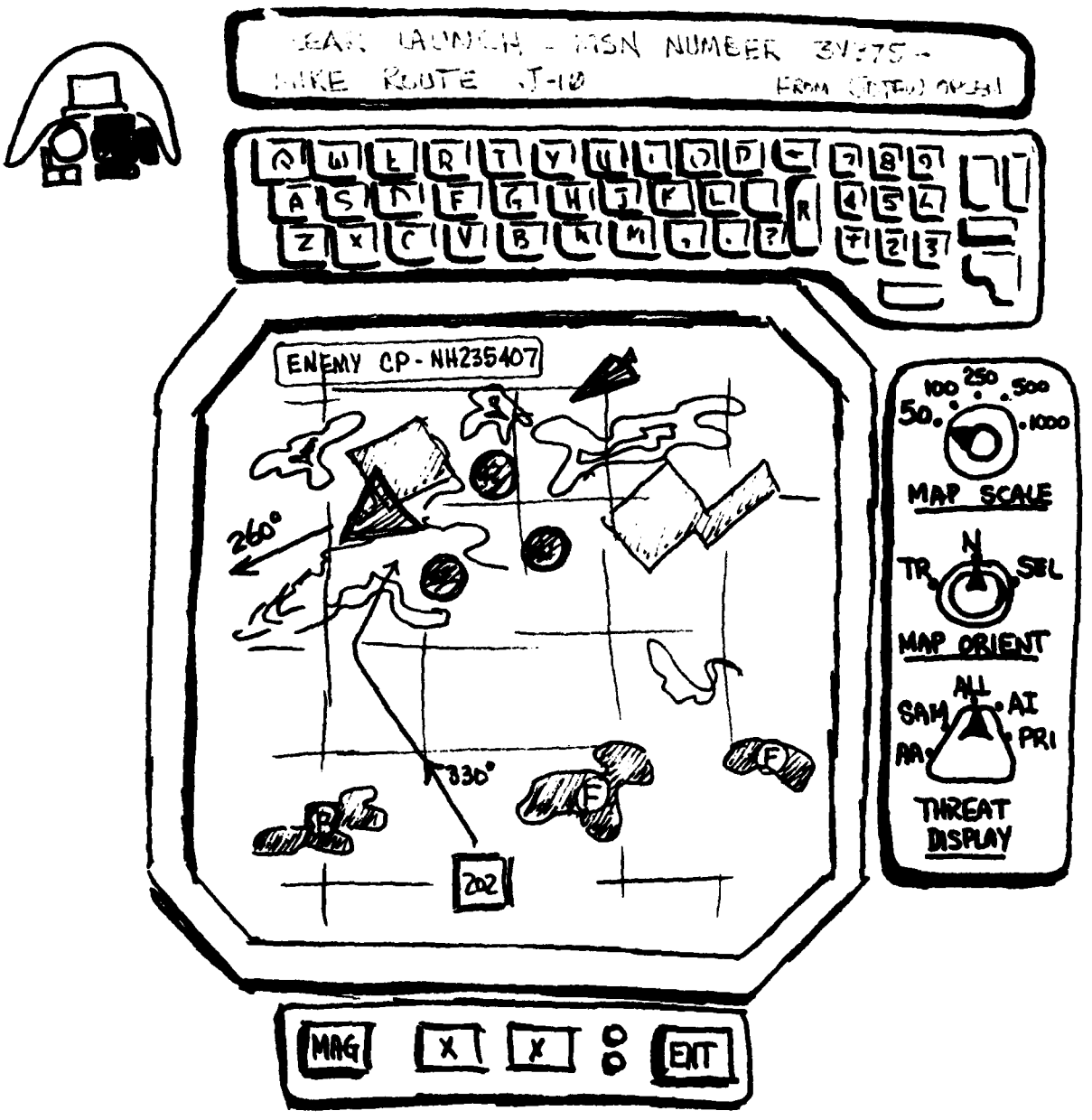


Figure 2 - DIGITAL MOVING MAP DISPLAY AND JTIDS TERMINAL CONTROLS

The datalink message placard on his instrument panel flashed mission clearance from his wing operations center: "CLEAR LAUNCH - MSN NUMBER 3V375 - MIKE ROUTE J-10".

James glanced in the direction of his wingman, released brakes, and selected afterburner. Three minutes later, the two jets were established on course 105 degrees magnetic, at 500 feet above the ground, at 450 knots indicated airspeed. James followed the minimum risk route as instructed although he realized that the new JTIDS now enabled NATO air defense centers and the AWACS to positively identify and track all friendly aircraft. If JTIDS proved itself, the cumbersome "Mike" procedures universally abhorred by NATO pilots would be history.

JTIDS also made it possible for the NATO command structure to observe and intervene in tactical operations as they unfolded. James was not yet convinced this was a good thing altogether, but it certainly appeared to enable deft application of force.

During the 15 minute flight to target, both pilots would crosscheck the accuracy of various navigation systems against known way points. Unless some malfunction was found which would affect the mission, the radio would remain silent.

Mark Thompson, Captain, USAF, battalion FAC, warmed his gloved hands around the steaming canteen cup of instant coffee. He stood in the narrow confines of the battalion command vehicle beside Major Robert Forrest, the S-3 and now acting battalion commander. The men watched silently as two blue electronic arrowheads moved across the screen of the commander's new JTIDS combat display toward the green square representing initial point (IP) 202. From there, the Falcons would accelerate and dash toward the enemy command post some five miles across the valley. Thompson had taxed his weary mind for the past several days reading the manual and practicing the JTIDS terminal controls. If the system actually worked as advertized, these Falcon pilots would be seeing up-to-the-minute battle information on their cockpit displays and he could send them secure and unjammable datalink messages. Only a few days ago, a night CAS mission like this would have had little chance of success. The technology was awesome. Would it work to save what remained of this battalion ? His mind wandered to the Soviet commander and his staff. He wondered if they were aware of how little time they had left to live. More likely the Russians were celebrating over a bottle of Vodka that the battered Americans across the valley, out of artillery ammunition, and with 30 percent casualties,

were ready to surrender or be overrun. Thompson supposed the final onslaught must come soon. His senses had become so dulled by combat, the thought did not produce the twinge of fear it should have.

At least they had finally convinced Corps they needed some air support. They would need plenty more unless they got resupplied and reinforced. But the FAC knew many other units were in just as bad shape -- or worse. Thompson supposed the enemy commander could not know a passive target designator held by a scouting party was reporting the position of his command vehicles through the JTIDS/GPS to the streaking jets with less than 50 feet error. By the time enemy radar detected and reported the low flying aircraft there would be scant seconds before cluster bombs would rip through the thin armor walls.

The equally battle weary major next to Thompson whispered into the mouthpiece of his field phone to confirm to his scouts that the Falcons were "inbound". Normally Forrest would coordinate artillery fire on known air defense positions as the jets approached. But the major realized if he had any artillery tonight, he wouldn't need the jets. His next logical thought was more of a prayer: If the fighters take out those jokers tonight it should delay their offensive until we can be reinforced.

Thompson heard the major's barely audible, "C'mon Air Force !", and silently nodded. He had fought beside these soldiers for a month that now seemed a year. He was a pilot, and this was not what he signed up to do. As the young FAC observed the jets well established on the proper attack run, he typed a brief message: "CLEARED HOT", into the JTIDS terminal. The message crossed 23,000 miles of space and was processed, encrypted, and flashed back to a number of terminals, including those of Colonel James and his wingman.

At that instant, the unmistakable CRACK! CRACK! CRACK! of a number of Soviet AK-47 assault rifles and the WOMP! WOMP! of light mortar rounds echoed through the tiny command post. Thompson and Forrest looked at each other. A month of daily combat had dulled the sense of panic any sane man would feel. It also had made the two men a close team. They stared silently at each other listening to the sounds outside -- assessing the distance, the direction, the number of enemy. Thompson had time to realize he had been wrong about the Vodka party -- this was the final attack!

Less than two seconds passed. Silent decisions were made and orders given and acknowledged through mere eye contact as Forrest reached for his field phone and Thompson bent over the JTIDS terminal.

James read, blinked, and read again the flashing

message placard: "UNDER ATTACK - STANDBY NEW TARGET." He gave his wingman a moment to digest the message, and rolled into a steep bank. Adrenalin slowed time, allowing many thoughts to fill the 20 seconds it took to roll out on reciprocal heading back toward the IP. As he began the turn, James hoped his wingman's cockpit displays would enable him to recognize what his leader was doing. James concentrated on keeping the green symbols in his heads up display perfectly aligned and hoped his young wingman would too. At their present speed it would take only a moment's inattention to allow the jet to enter a steep descent into the invisible hills 400 feet below. And what kind of problem was the army having on this relatively quiet early morning ? Would this unproven system be able to cope ? No, he realized the real question that was bothering him was -- would HE be able to cope ? He was a highly experienced fighter pilot, but he was also rusty. And his wing hadn't trained for this kind of mission. As far as he knew, nobody had done night CAS -- real "close" CAS -- with the JTIDS before.

James rolled out and noted with relief the electronic symbol representing his wingman's Falcon swept back 45 degrees at a half mile -- just as briefed. But the red target triangle had disappeared from his map. As James watched a new red triangle appeared and new digital coordinates and target description were etched in their allocated spaces. As he had expected, the new target symbol was nearly touching the irregular green shape of the friendly perimeter. His message placard came alive. "URGENT HIT NEW COORDS -- ALSO HIT ORIGINAL TGT." If the system was working right, a single press of a button would enter the new coordinates into his fighter plane's attack computer. The colonel took only a few seconds before reaching toward his instrument panel to compose his first JTIDS message: "ROGER ALL - LEAD HITS NEW TGT - WINGMAN HITS CP - ASAP." James waited a moment for acknowledgement from the army and his wingman, took a deep breath, and turned back toward the target area.

Less than two minutes had gone by since the first shots had been fired and much had been accomplished by the war-weary but determined soldiers and their FAC. Forrest had taken personal charge of the defense while Thompson remained in the CP reorganizing the air support. Since he was about all the staff the unit had left, Thompson prepared a terse message to Corps about their situation and pressed the "SEND" button. With any luck more airpower would be on the way within 30 minutes. The young FAC recognized a professional was leading the formation of little blue arrowheads that now once again were pointed toward the red triangles on his screen. He watched the leader turn away from the

target at first and then reverse back to circle around the friendly perimeter and approach the enemy from the flank. The wingman pressed ahead toward the enemy command center whose inhabitants were no doubt monitoring and directing the movements of their attacking soldiers. Thompson was satisfied with the flight paths of the inbound fighters. He typed a few words into his keyboard and reached for the field phone.

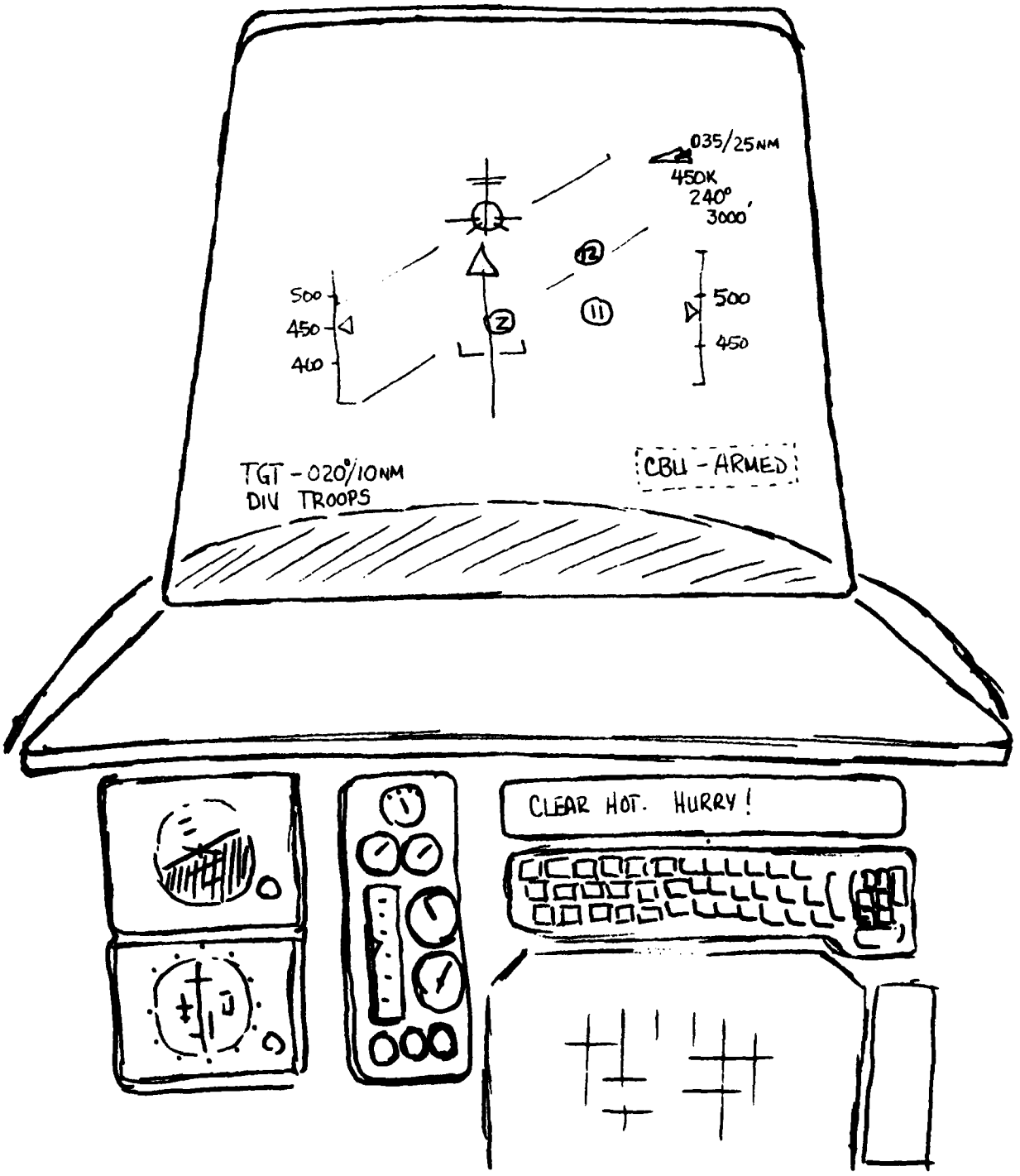
Bob Forrest had time in between terse orders to be proud of his soldiers. The chances were pretty good this would be a replay of the Little Bighorn. Every one of these guys knew it. There was urgency as the remaining two light machine guns were respotted and men sought ideal firing positions, but there was no panic. The first job had been to stop the initial attack. The Soviets had underestimated the remaining strength and alertness of the battered unit. But Forrest's night scope revealed the fresh assault force now moving steadily up the rough slope toward them was plenty strong enough. Forrest guessed there would soon be Soviet artillery on the way, too, coordinated by his counterpart on the ridge across the valley. He noted his designator teams aiming the JTIDS/GPS target markers at the center of the enemy assault units. He heard Mark's voice over the field phone shout, "Thirty seconds!", as his men opened fire at the leading Soviet soldiers.

As James lined up the computer generated cues which would automatically release his weapons on the target coordinates, he saw the flashing message, "BOTH CLEARED HOT, HURRY!". Other symbols in his heads up display confirmed his cluster bombs were armed and ready. (See Figure 3 - Heads Up Display). He just had time to recall the 50-foot accuracy specifications on the JTIDS-attack computer integration before his four bombs were ejected into the darkness.

The advancing Soviet riflemen heard the scream of a jet engine split seconds ahead of the first explosion.

EPILOG. During that early September morning and through part of the next day, over two thousand tactical sorties poured fire into Soviet Army units in a number of critical sectors along NATO's thin forward line. The enemy was fought to a standstill at the front, and began taking serious losses in his congested rear, as NATO airpower gradually gained the upper hand. The Soviet stranglehold on Eastern Europe began to relax as the specter of defeat rose over the smoldering battlefields.

FIGURE 3 – HEADS UP DISPLAY



(AUTHOR'S NOTE. The author has presented his own stylized vision of how JTIDS and other supporting systems could work to solve some of the many problems we have discussed. The author is not an authority and has deliberately avoided classified research on such systems for this paper. Any resemblance to classified aspects of system operation is therefore purely coincidental.)

The Wes James saga may sound like Buck Rogers but military journals have been advertizing such concepts and technology for years. It remains an enormous challenge to develop the various capabilities and field a coherent and practical system. Of course such C3 improvements must also be accompanied by better, smarter munitions to get more kills per sortie. We also need to continue efforts to reduce the air defense threat with new electronic countermeasures (ECM) and lethal suppression capabilities. Realistically, we are years away from a practical CAS capability such as described. In the meantime we remain dependent on the traditional radios, FACs, and whatever improved procedures and tactics we can adapt.

NEAR-TERM IMPROVEMENT NEEDS.

The only bright spot in our abysmal C3 situation is that anything we do is bound to help. The most pressing need is to rebuild our FAC force and provide them with appropriate mobility. These specialists have had to be "reinvented" every time we've gone to war in this century. They are the bridge between the ground troops and the fighter pilot. A recent article by a USAF FAC on the scene in Europe calls for the consolidation of U.S. FACs at

army brigade to centrally manage the shortage of battalion FACs. This shortage of USAF FACs to fill authorized billets with the Army in Central Europe must send a more eloquent message to the Army than all our reassurances about the next CAS airplane. (25:41). Without enough well trained and equipped FACs, we just can't do effective CAS. Period. Not even with the A-10. Especially not with the A-16.

The airborne FAC survivability problem is acknowledged. The "slow" FAC, even one in an A-10, is not going to be able to orbit over the Soviet army. However, there are many things a FAC with the right communications and current picture of the battle can do to help the fighter pilot get on target and safely home. I believe FACs need to be in a number of key locations. Some continue to be needed at the shoulder of the army unit commander to help him in the crucial decision of whether or not to call for air support, and if so, where and when to strike. Other FACs should be in army scout helicopters providing the air force perspective during battlefield reconnaissance and directing the actual airstrikes. Other FACs should be in airborne battlefield command and control centers (ABCCC) and OV-10s or perhaps OA-10s, helping to augment communications, CAS/BAI coordination, and firepower. The picture I'm trying to paint is one of an unbroken and overlapping chain of air force CAS specialists working as a team to carry the air force situation to the army and the army situation to the air force. If we are to carry out large scale CAS operations, we need a lot more FACs than we have now.

The American airborne FAC in his T-6, L-19, or OV-10 has done that unique job in three major wars. (Nearly every other nation has had similar experiences in this field.) The FAC's role and his need to be airborne remain important despite our concerns about the threat.

Perhaps eventually, technology will permit us to replace our FACs with a "black box" in the hands of the infantry soldier. But that day is not here yet. It's hard to blame young fighter jocks for not wanting to volunteer to join the Army for two or three years. Maybe they should be offered a bonus. The shortage of FACs is certainly worthy of increased attention.

TARGET MARKING. If, as we have said, the single most important factor in effective CAS is whether or not the pilot sees the target, it would seem prudent to focus a major effort on better ways to mark targets. One of the advantages of CAS over deep attack missions is that since, by definition, friendly troops are near the target, they can assist the CAS pilot. In the absence of natural topographical "first look" features, or the lack of reliable radio communication, the friendlies can provide artificial visual or electronic features to help the fighter pilot see his target. Moreover, the use of an artillery smoke round or laser target marker gives the ground force commander <u>direct positive control</u> of what the CAS pilot sees as his target.

From the fighter pilot's point of view, target marking should

be visible from a distance (about five miles gives most aircraft the desired maneuvering space). It is also desireable for the target mark to be visible not only in the heads up glass in front of him (such as with current laser marking systems) but also out the side of his cockpit canopy (such as with smoke or flare marking). In Vietnam we fired white phosphorous smoke rockets near the target so the fighter pilots would easily see and have no doubt about where to aim their weapons. We don't currently plan to do that in Europe for several reasons: FACs probably won't be able to survive making rocket passes, artillery may not be available or in range to fire a smoke round, and there may be so much other smoke in the battlefield it would not make a prominent or distinctive mark.

> (AUTHOR'S NOTE. All these are valid problems but there appears to have been little real effort to overcome them. This tends to reinforce the author's impression that we are not taking CAS seriously.)

Imagine if our ground troops were able to explode a spectacular fireworks display over a target. Various shapes and colors could even represent coded information about the target. The idea is to use something unique and highly visible that would not be confused with other battlefield phenomena. From five miles away, a pair of fighters see the fireworks display and visualize how they can circle around terrain and known enemy positions to sneak up on the target, (just as Colonel James' JTIDS map display enabled him to do). We can anticipate the enemy would soon learn to duplicate our fireworks over friendly positions, but

this would take him some time. There is still the problem of how the ground commander arranges to get the fireworks over the enemy -- maybe artillery, maybe a drone, maybe a small band of very brave soldiers.

Once the pilots have maneuvered around the battlefield and approach firing range, the FAC or ground troops can provide precise target identification using a laser mark which is visible in the fighter pilot's heads up sight glass overlaying the target. This allows the CAS pilot to fire accurately even if the target is as difficult to distinguish (such as that enemy commander's tank mixed in with other enemy or friendly vehicles.) Also the ground troops can use their laser spot to guide newer bombs and missiles precisely to the target while our air warrior is on his way home.

Note the emphasis I have placed on the <u>combination</u> and <u>sequence</u> of target marking means. This combination illustrates the fighter pilot's problems and ideal assistance he needs for success:

(1) Visualize the general area of the target from some distance away to plan and coordinate specific maneuvers to arrive at firing position.

(2) Approaching firing position, pinpoint the precise target for weapon aiming.

If such a combination of marking means and the supporting procedures and tactics were available, the fighter pilot could execute a precise attack without having to devote so much

attention to looking for the target that his survival is threatened. There is simply no substitute for the fighter pilot being able to see early and precisely the place where the ground commander wants the weapons to hit.

My basic recommendation is therefore that every army unit should be equipped with plenty of effective, standardized pyrotechnic marking devices and laser target designators. CAS airplanes should be equipped to display laser marks to the pilot. (Although these devices have their drawbacks, at least they add options which may make the difference between success and failure of a critical mission.)

In addition, NATO and U.S. procedures should focus on providing the pilots of A-16s and other newer aircraft, accurate target coordinates for their nav-attack computers as early in the sortie as possible.

Another approach to help the fighter pilot find his target and survive on the battlefield is joint cooperation. The NATO armies have a growing number of assets which can greatly assist the fighter pilot in performing effective and survivable CAS.

JOINT COOPERATION IN CAS. As we discussed earlier, it is something of an advantage to be moving slowly enough to have more time to scan for the target. The army attack helicopter takes this to the ultimate, hovering at zero airspeed, and hiding behind a tree or rock, waiting to stick a TOW missile in the side

of one of those unsuspecting commander's tanks. Joint Air Attack Team (JAAT) operations enable A-10 pilots to take advantage of protective fire cover from these sharpshooters, while the helicopter crew takes advantage of the A-10s stirring up the enemy to get in more of their own lethal shots in relative safety. A-10 units have exercised with a number of both U.S. and Allied attack helicopter units. Indications are that this joint team idea is gaining broader support within NATO.

Besides mutual defense, the A-10s (or A-16s) get another important benefit. These Army chopper crews know exactly what's going on in that battlefield. They know the latest army maneuver plans and target priorities. As fewer Air Force FACs are available or in position to direct airstrikes, Army attack helicopter "battle captains" can take on more of the FAC's traditional role -- and they have the necessary battle information, mobility, communications, and target marking means at their fingertips. A Hellfire missile from an Apache helicopter is as good as a FAC's smoke rocket to help guide our fighter pilot's eyes to his target area. It also helps when that Hellfire nails a Soviet ZSU-23-4 AAA gun system.

I don't agree with a number of proponents who believe Army helicopters can completely replace Air Force fast jets doing CAS, simply because I believe great concentrations of force are required, but many current joint exercises are producing solid evidence that army helicopters and air force jets are an excellent complement to each other. (3:5). The combined

effects of tank guns, artillery, attack helicopter fire, and Air Force CAS can be devastating against an exposed enemy army unit and provide an additional margin of survival for all engaged friendly forces.

As we have seen, technology promises long term solutions to the CAS dilemma, but until the future is here our FACs and fighter pilots must rely on their wits and closer joint service cooperation to get the most out of their respective capabilities.

HIGH THREAT CAS TACTICS -- "THE NEED FOR SPEED."

Navy "Topgun" pilots aren't the only ones who appreciate that high aircraft speed complicates the enemy air defense gunner's problem. Defense planners tend to assume that an airplane designed for CAS has to be slow in order for the pilot to have time to see his target and accurately deliver his weapons. (8:79). That has been our experience to date. But the future of CAS depends on a change in this traditional attitude. Of course, we continue to need precision weapon delivery near our troops but at the same time we must somehow significantly increase the CAS aircraft attack speed to enable the pilot to survive and fight another day.

While the A-10 works a target at over 300 knots, the F-16 attacks at over 400 knots, which reduces exposure time and provides improved survivability. However, even faster speeds are desireable to compress the enemy detection-engagement time. High speed can also work against the pilot by increasing his critical

workload, thus reducing his navigation and weapon delivery accuracy, and thereby reducing the chances of success of his attack. Fortunately, state of the art nav-attack computers enable pilots of our latest fighters to get good navigation and weapons results while maintaining high speed. But conducting CAS at significantly higher attack speed requires a fresh approach to planning, fighter-FAC coordination procedures, and fighter CAS tactics. (Not to forget a substantial "public relations" campaign to reassure the Army that the Air Force intends to keep the safety of the ground soldier paramount.)

For a good example of adapting tactics to meet mission requirements and the threat, it is instructive to look at how the pilots of the Royal Air Force in Germany Harrier Wing approach the CAS problems we've been discussing.

Although the British are among those who favor BAI to CAS, they recognize it may be necessary to do CAS if things do not go as planned. They train at CAS and are relatively successful despite the limitations of the Harrier for the CAS mission.

(AUTHOR'S NOTE. Despite its ability to land on a tennis court, the performance of the Harrier in flight is much like the F-16 -- same size (tiny), same speed (fast), same legs (moderate), same weapons load (4 bombs) -- not what we normally think of as the optimum CAS airplane. Organizationally it is significant that each RAF Harrier squadron has three experienced British Army senior field grade Ground Liaison Officers (GLO) permanently assigned. This compares to one US Army company grade GLO for each A-10 base! The U.S. Marines, like the RAF, do well with their Harriers because their pilots specialize in CAS and they have an effective well-manned air-ground operations organization.)

RAF attack pilots pioneered high threat, low level, high speed tactics for European interdiction and adapted them to CAS. They recognize that CAS does not demand a slow speed attack only an absolutely accurate attack. Capitalizing on their superior low level pilotage (navigation by map reading) proficiency, they arranged for communications relay from the front lines to their hidden "airfields" not far from British Corps HQ so they could mark the latest target and friendly positions on their large scale target area maps just before takeoff. They could then navigate themselves precisely to the assigned target and be attacking within ten minutes, requiring a bare minimum of communication with the FAC. These procedures enabled the Harrier Wing pilots to work around the existing inadequate command and control arrangements to give them a higher probability of success hitting the target while flying their planes in a way they felt was most survivable.

If the A-16 is to be effective and survive its pilots must also work out tactics which exploit the A-16's advantages, such as its excellent nav-attack computer, and its speed. It will greatly facilitate this process if at least a portion of the A-16 force is dedicated fulltime to the CAS and BAI missions so pilots can concentrate on developing their tactics and getting to know the enemy army they might face and the NATO army they would be supporting.

It goes without saying that more FACs, new equipment, and revised procedures are not enough. FAC and fighter pilot skills

must be developed and honed through regular, realistic training exercises.

THE VALUE OF UNIT AND INDIVIDUAL SPECIALIZATION. By this point the reader should be convinced that this CAS business is a little tricky. The pilots who do it best do nothing but CAS and they do it all the time. It was therefore encouraging to read the words of Lt. General James R. Brown, Vice Commander of Tactical Air Command, in a recent interview on the subject of air support. He said, "We want the A-16 to be dedicated to the army commanders....The A-16 will be their airplane....we will even give it an Army paint scheme." (8:80).

It remains to be seen if the A-16 wing organizations and pilots training will be totally focused on supporting the ground battle. Air Force units whose mission is focused on a particular role, be it an air superiority F-15 wing or the "Wild Weasel" defense suppression squadrons, develop special procedures for carrying out their missions in the most efficient manner. They have particular intelligence needs, special logistics requirements, and especially, they have a focused training program for their aircrews.

From the preceding discussion, one can readily see the critical importance of aircrew specialized training for CAS focused on Allied and enemy battlefield tactics, army vehicle recognition, and intimate familiarity with the terrain of the battlefield. A-10 pilots are fortunate that the A-10 is a

specialized aircraft and they can devote most of their flying and studies to close air support, and visiting the army units in their planned wartime defensive positions, while pilots of other aircraft often have to divide their training time between two or more different types of missions, such as attacking enemy airbases or hunting MiGs.

Ironically, the newer, more capable aircraft, such as the F-16, are designed to perform a variety of air missions well. The problem is, a pilot can only practice so many hours each month. The more varied his mission, the more diluted his training must be. CAS is far more difficult for those who cannot specialize, yet they too may have to do it. Regardless of the quality of their aircraft, pilots who don't specialize in CAS, who don't know the NATO defense plans and key terrain like the back of their hands, and whose airplanes lack the specialized equipment (such as laser marking in their heads up display), will find today's NATO CAS almost impossible to do.

On the other side of the coin, it is a difficult decision for Air Force leaders to restrict a unit flying an aircraft like the F-16 to a single specialized mission. It is important to retain the flexibility to rerole our most capable aircraft to respond to the changing battle situation. It is a true dilemma because the price of this flexibility is that your fighter pilots may become "Jacks of all trades...." Fortunately, emerging technology offers the promise that a single pilot will have such a capable airplane, weapons, and electronics combination, that once he

masters its use, he can apply its capability with equal ease whether the mission is attacking an enemy airfield or a group of enemy tanks near our own troops. Once such technology is available, mission specialization as we are advocating now may no longer be appropriate.

If we accept the idea offered earlier that CAS depends on an interdependent combination of elements (the bomb dropper and the control system that tells him the target), we see we have some choices for applying specialization. For example, we can dedicate our A-16 wings to CAS as we have the A-10s, and make minimal improvements to the C3 (TACS). This would rely on the A-16 pilots to become very expert to offset the CAS limitations of their airplane and the control system. Alternatively, we could charge the people who run the TACS to upgrade their control capabilities such that they make it easy for almost any NATO bomb dropper to do CAS without killing friendlies and allowing the fighter pilot to employ best tactics for his own survival. The latter course of action would have the advantage of allowing A-16 pilots to train in a variety of missions and still do a good job of CAS. Also since C3 improvements can enhance all NATO forces, if CINCENT were forced to rerole his air forces for maximum CAS, they should be much more effective. But whether any of these options are implemented still depends on our U.S. and Allied military and political leaders recognizing the need exists.

CHAPTER VI

CONCLUSIONS

CLOSE AIR SUPPORT REMAINS RELEVANT. Many believe Soviet air defenses have made CAS obsolete. I believe these people are really saying that our traditional CAS tactics are obsolete, not the CAS mission itself. For CAS to be impossible, it would mean our airplanes are totally unable to attack an enemy unit near a friendly unit. But no defense system is perfect. As awesome as the Soviet defenses seem to be, many of our aircraft would attack successfully. It's really a question of whether our air losses would be acceptable when balanced against the alternative of allowing the NATO armies to be overrun. It may be that CAS, even if costly, could make the difference between victory and defeat in Europe.

It is here appropriate to recall Israeli General Chaim Herzog's description of the initial situation in the 1973 Arab Israeli War.

> In the first phase of the fighting -- the holding phase -- the Air Force was unable to attack as planned and was obliged to throw caution to the winds and give close air support (a good proportion of the sorties were made in close air support of the ground forces), without dealing adequately with the missile threat and achieving complete air superiority. Consequently losses were comparatively heavy. (24:258-259).

The IAF was ill-prepared for high threat CAS in 1973. NATO is even more ill-prepared. The Israelis were forced to do CAS to save their army. NATO may face a similar lack of choice. It would seem prudent for NATO to take action now to improve CAS

capability.

U.S. Air Force top leaders recently reassured the U.S. Army Chief that the Air Force understands the priority the Army places on air support for the success of the AirLand Battle and restated the Air Force is committed to providing that support. (8:80). Apparently our senior leaders do not agree with those who claim that CAS is obsolete ! I believe they are relying on us out in the field to do whatever is required to make CAS effective.

WE MUST GUARD AGAINST A BLINDSPOT IN CAS DOCTRINE. The Army is only guessing that it can stop the first echelon while the Air Force is only guessing that it can chew up and delay the second echelon. While it is to be hoped these optimistic assumptions prove correct, it is at least possible they represent an "intellectual Maginot Line", upon which so much hinges in our current military thinking. If one or both of these basic assumptions proves incorrect, the result is an urgent need for massive and effective CAS. I've tried to show why it may not be available in the quality and quantity required.

There is no question that Vietnam-era CAS tactics are obsolete in a high threat battlefield. But CAS itself - the ability for Air Force aircraft to lay down massive and accurate firepower near friendly troops exactly where and when the Army needs it - continues to be an urgent and essential requirement.

U.S. Air Force leadership must accept and argue that for the time being, there is no adequate substitute for air force CAS in

the European ground battle. There is little doubt, given the respective ground orders of battle in Central Europe, that CAS will be called for in great quantity with dire urgency in the very early going if Soviet tanks roll westward in Europe. This view collides with strongly held views to the contrary of many soldiers and airmen in our own Country and among our Allies. It is not preposterous to imagine CINCENT being forced to order every attack-capable NATO aircraft into the close ground battle, involving thousands of sorties in the period of a few hours. Despite what we may think now, NATO air forces will have no choice but to answer that call with whatever capabilities we possess at the time.

IMPROVEMENTS NEEDED TO EXPLOIT OUR AIRPOWER EDGE. If fast jets like the A-16 are to answer the CAS call, we need to make many short and long term improvements in equipment, procedures, tactics, and training within the CAS fighter force and the C3 system to give them a fighting chance. Unless we start now to make those improvements, we are <u>not</u> going to be able to do the job.

It may be that I am "clinging to the horse cavalry" and those who say CAS is no longer practical in the high-threat battlefield are quite right. But if so, what is the effective substitute?

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GLOSSARY

AAA -- Antiaircraft artillery

ABCCC -- Airborne Battlefield Command and Control Center

AWACS -- Airborne Warning and Control System

BAI -- Battlefield air interdiction

CAS -- Close air support

CINCENT -- Commander in Chief Allied Forces Central Europe

C3 -- Command, control, and communications

ECM -- Electronic countermeasures

FAC -- Forward air controller

FSCL -- Fire support coordination line

GPS -- Global Positioning System

IP -- Initial point

JAAT -- Joint air attack team

JSTARS -- Joint Surveillance and Target Acquisition Radar System

JTIDS -- Joint Tactical Information Distribution System

LANTIRN -- Low Altitude Navigation and Targeting Infrared for Night

MIG -- Mikoyan-Gurevich (Soviet aircraft designers specializing in interceptors)

OMG -- Operational maneuver group

SAM -- Surface to air missile

TACS -- Tactical air control system